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ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

British Railway Air Services

TWO outstanding characteristics of the enterprises of Railway Air Services Limited are the interavailability of rail and air tickets and the co-operation with existing facilities. As recently as March 30 last we remarked that the geographical peculiarities of Great Britain are such that the limited need for high-speed long-distance air transport can be provided in the best public interest only as a supplementary service to the railways. The Southern air service to the Isle of Wight, which was inaugurated on Tuesday, adequately meets these requirements, in that tickets are bookable at many important Southern Railway stations; are available for return by first-class steamer and rail routes; and permit of consigning heavy luggage in advance. Co-operation with existing facilities is further exemplified by the arrangement for Spartan Air Lines Limited, which worked the route independently last year, to continue to maintain it, but under railway auspices. The G.W.R. associated route, Plymouth-Teignmouth-Cardiff-Birmingham, is being resumed on Monday next, with an extension to Liverpool. A welcome feature is that connections have been arranged at Cardiff with the service to Bristol and Bournemouth of Western Airways Limited, thus showing that Railway Air Services Limited is co-operating with private enterprise.

Travelling Show Trains

Following on the success which attended the introduction last year by J. S. Fry & Sons of a new method of salesmanship when that company utilised a travelling show train to tour the country for the purpose of exhibiting its latest products to potential customers, the Gramophone Co. Ltd. of Hayes, Middlesex, has now completed arrangements with the four main line companies for a similar venture in connection with the display of the latest radio and gramophone apparatus. The three vehicles composing the train—two eight-wheeled covered carriage trucks and an old dining car—were stripped of their interior fittings and then re-decorated and fitted throughout in the Gramophone Company's own siding at Hayes by that company's staff, the cost of decoration alone being stated to exceed £2,000. Full particulars of this train, which began its tour on Tuesday, are given in our news columns. Judging from the remarks of the firm's managing director at the inspection of the train at Paddington on April 27, and the number of applications which are being received by the railway companies, it would appear that their cordial co-operation has been successful in opening wide possibilities for this novel method of advertising.

* * * *

The Week's Traffics

There was a general decline in passenger train earnings of the four group companies for the past week, possibly due to the fact that they compare with those for the week after Easter last year, when summer tickets had not come into operation. Merchandise earnings are up except on the Southern, and for the year to date the L.M.S.R. increase in this traffic is £744,000, the corresponding increase on the L.N.E.R. being £652,000, on the Great Western £300,000, and on the Southern £41,500.

	17th Week				Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	
	£	£	£	£	£	%
L.M.S.R. ..	– 5,000	+ 21,000	– 2,000	+ 14,000	+ 1,043,000	+ 5·94
L.N.E.R. ..	– 9,000	+ 28,000	+ 22,000	+ 41,000	+ 1,089,000	+ 8·53
G.W.R. ..	– 10,000	+ 5,000	– 6,000	– 11,000	+ 332,000	+ 4·55
S.R. ..	– 3,000	– 3,500	+ 500	– 6,000	+ 113,000	+ 1·99

* * * *

Accident Inquiries in 1933

There were 18 train accidents inquired into by the Ministry of Transport last year. That figure compared with 8 in 1932, 15 in 1931 and 13 in 1930, but was less than the average of previous years. Ten of the 18 inquiries related to collisions in which passenger trains were involved; 3 were collisions between goods trains, and one was a passenger train in collision with a road motor vehicle on a light railway. Two of the inquiries related to buffer stop collisions; one was the derailment and subsequent collision at Raynes Park; and the remaining inquiry related to the landslide in Vriog cutting. In only one of the above accidents was there loss of life among passengers, the five killed at Raynes Park. Nine railway servants were, however, killed in the accidents inquired into; one servant lost his life in each of three of the passenger train collisions, two servants in each of two of the goods train collisions, and two in the Vriog cutting accident. Additionally to the above there was one passenger killed in an accident that was not the subject of a Ministry of Transport inquiry; that was at Glengarnock on September 30, when a shifted load on a passing goods train killed a woman in a passenger train travelling in the opposite direction. The only previous case in the present century where there was no Governmental inquiry into an accident in which there was a loss of life among passengers was the buffer-stop collision of March 10, 1920, at Firsby, Great Northern Railway, in which one passenger was killed.

Competitive Sandwiches

The *Canadian National Railways Magazine* has arranged a "brighter sandwiches" competition, for the benefit of those of its employees and their young who take their lunches with them to their work. These are some of the suggestions for "fillings": chopped dates and nuts moistened with orange or lemon juice; peanut butter and orange marmalade; fried liver and bacon finely chopped and mixed with a little pickle. Even if such ingredients do not appeal to the English taste, the *C.N.R. Magazine's* cry for sandwichian improvement will be echoed in these isles, where the staleness of the railway sandwich is the venerable theme of jokes. For a hasty snack our nationals instinctively turn to the ham or beef sandwich which somehow seems typically English; sardine or crab and tomato may be all very well in their way, but they lack solidity. If in our railway buffets we could be sure of getting sandwiches containing youthful and good ham (or beef) and a spread instead of a scrape of good butter, we should feel that we were getting our money's worth and were upholding the best traditions of our native land.

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Overseas Railway Traffics

Among Argentine railways the most encouraging traffic feature during the past fortnight has been the advance in the receipts of the Buenos Ayres Western, which have improved during that period to the extent of £30,000 and are now £3,000 better for the year to date. In the two weeks the Buenos Ayres & Pacific has reduced its decrease by £18,000, and the Central Argentine has done so by £14,000. The Buenos Ayres Great Southern, on the other hand, has gone back £58,000 and is now £53,000 to the bad on the year's takings. Canadian Pacific net earnings for the first quarter of 1934 are £385,800 better than those for the first quarter of 1933.

Railway	No. of Week.	Weekly Traffics. £	Increase or Decrease. £	Aggregate Traffic. £	Increase or Decrease. £
Buenos Ayres & Pacific	43rd	145,000	+ 8,000	4,711,000	— 56,000
Buenos Ayres Great Southern ..	43rd	193,000	— 40,000	8,738,000	— 53,000
Buenos Ayres Western	43rd	90,000	+ 10,000	2,915,000	+ 3,000
Central Argentine	43rd	187,000	—	7,161,000	— 645,000
Canadian Pacific	16th	438,200	+ 71,400	6,803,200	+1,001,400
Bombay, Baroda & Central India	3rd	165,450	+ 375	499,125	+ 3,900

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Train Services in Belgium

Travellers in Belgium can hardly fail to be struck with the general smartness which characterises railway working there. To begin with, and most important to anyone with little time to spare, the trains are remarkably fast—50-60 m.p.h. bookings being numerous—and punctuality so nearly perfect that two-minute margins for connections at junctions are almost invariably to be relied upon. The trains themselves are now composed largely of the new and comfortable all-steel stock, of which a great amount has been built recently, and their appearance is attractive. because both locomotives and carriages are kept clean so that their pleasant green colours show up well. Punctuality on the fast schedules of to-day is greatly assisted by the general use of set trains of definitely limited accommodation. These trains are specially marked in the time-tables, but the services are so frequent that, even on the rare occasions when passengers have to be left behind, little inconvenience results. Further, seats are bookable in advance on these trains. Local services have also come under the accelerating influence and there are now many extremely brisk little trains composed of a couple of light coaches and a steam locomotive. To secure the most economical working, these light trains, which have become highly popular, are eventually to be replaced by railcars, of which there are already a number in use.

Belgians Like Railcars

Good children in Belgium are nowadays urged to continue in virtue, and are rewarded therefor by being taken for Sunday rides in the "Pullman," which is the popular name for the cheerful blue and cream railcars to be seen running about on local services in increasing numbers. Not only are they of enticing appearance—they are kept scrupulously clean—but their large windows afford to their passengers ample views. The introduction of these railcars about three years ago has been justified by the new traffic they have brought to the Belgian National Railways. The railway network in Belgium is dense, and lines intersect every few miles in the industrial areas. The addition of railcars and light trains has enabled better services to be given, making convenient connections at points of intersection, and the public has responded well to the new facilities. Both steam and diesel cars are in use and have proved almost a hundred per cent. reliable. There are three Sentinel cars at work in the Liège district which have never faltered for over three years. During the period November, 1930, to October, 1933, these cars covered altogether 536,021 miles, or nearly 60,000 miles each, on local services without a heavy overhaul and with extreme economy.

* * * *

Early Electric Signals on the Circle

The late C. E. Spagnoletti, at one time Telegraph Engineer to the Great Western Railway and originator of the disc block telegraph instruments still used on that line, took out a patent in 1873, No. 2401, for operating semaphore arms electrically. It appears from some technical notes prepared by him at the time, which came under our notice recently, that he installed two of his signals experimentally on the Inner Circle at Queen's Road and Praed Street stations in 1875, the same year in which W. R. Sykes installed his electric signals at the Penge tunnel on the London, Chatham and Dover Railway. How long the trials lasted and with what result we are not aware, but Spagnoletti was evidently very enthusiastic at the time about his electric signals and their capabilities. When R. C. Rapier's paper on Railway Signalling was read before the Institution of Civil Engineers on March 31, 1874, Spagnoletti described these electrically operated semaphores and explained that they would be most useful for carrying out what we now know as intermediate signalling, combined with his rail-contacts, and enabling block posts to be abolished, with consequent saving of expense to the Great Western. He also foreshadowed the ultimate disappearance of mechanical in favour of electrical interlocking. Thereupon a Mr. R. R. Rowe, of Cambridge, declared from his experience of electricity that "without a strong staff of electricians, and of gentlemen such as Mr. Spagnoletti, to keep them going, he should not like to rely on it!"

* * * *

Are Drivers Becoming Less Vigilant?

A Continental signalling engineer, with whom we recently discussed certain cases of signals being over-run, suggested that locomotive drivers are less vigilant now than formerly, or rather, that altered conditions have created new causes of their being distracted from keeping a proper lookout. He said that when he served on the footplate thirty years ago his railway did not provide distant signals for intermediate block posts but expected drivers to see the stop signals in time and observe them. Nowadays distant signals were in universal use and warning boards were provided to help drivers to locate them, but, in spite of modern refinements, signals were still at

times unheeded. He wondered whether the changed conditions of life in general might be tending to blunt the senses and diminish the steadiness of drivers' nerves. He told us that statistics had shown that on his section of the line there had been as yet no case of an electric locomotive, on which the driver is right in front and has an uninterrupted lookout, being driven past signals at "danger." Do the large boilers and small cab windows of modern locomotives have any tendency to take the driver's attention off the line in front of him? The subject is of much psychological interest, but it must be remembered that the accident at Bellinzona in Switzerland some years ago, which was partly due to signals being ignored, occurred with an electric train.

* * * *

Pennsylvania Railroad 1933 Results

The annual report of the Pennsylvania Railroad Motive Power Department reveals that the results achieved in many directions during 1933 represent a considerable improvement upon those of the previous year. Passenger trains, for example, travelled 14,154 miles for each delay due to a locomotive failure as compared with 12,302 miles per engine detention in 1932. Freight trains travelled 15,886 miles last year for each locomotive failure as compared with 14,093 miles in the previous year. The improved condition of the rolling stock was reflected in the fact that coach failures in 1933 caused a passenger train detention only once in every 251,854 miles in contrast with a delay once in every 208,884 miles in 1932. There were also fewer hot journals in passenger service than heretofore. Whilst this improved performance was being recorded on maintenance of equipment, expense per locomotive-mile declined from 59·94 cents (2s. 6d.) in 1932 to 59·06 cents (2s. 5½d. in 1933, a saving of almost a cent (a halfpenny) per mile throughout the year. Locomotive mileage decreased 2 per cent. in 1933 as compared with 1932, while a reduction of 4 per cent. was achieved in maintenance of equipment expenses. Last year's improved performance, in the face of reduced costs, is especially noteworthy owing to the fact that on the Pennsylvania Railroad delays to passenger trains due to engine and rolling stock failures included those of only a fraction of a minute and, indeed, the slightest delay is recorded, whether or not the train regains its schedule and reaches its destination on time.

* * * *

Preventing Sleeper Splitting

Though experienced to some extent in almost all countries, trouble due to the splitting of the ends of sleepers is greatly accentuated in torrid areas, and particularly so with certain timbers. In fact, it assumes the dimensions of a major problem for the permanent way engineer in a tropical desert country, and appears to be one that has never been solved really satisfactorily. In the past the crude method of nailing hoop iron round the sleeper ends was extensively used on some railways, but the more common preventive against splitting is the use of some form of bolted clamp. For instance, it is standard practice on many overseas lines to bore and put a small bolt through the end of every transverse bridge timber, a large square washer being fitted on each side of the timber. Other forms of clamping, less extensively used, are the all-round flat-section clamp, with a short bolt drawing together the two up-turned ends, and also that having a vertical bar or angle at each side of the sleeper, drawn together with a bolt top and bottom. But a form of clamp which is, we believe, not yet widely in use, is the tensioned hoop-iron band as used for packing cases or bales, modified if necessary for permanent way work. The band is applied by a simple and easily portable tool, which, however, exerts great tension in the band and automatically seals and cuts it off by the movement of a lever. There seems to be an opening for such a method which is cheap in first cost and requires no tightening or greasing of bolts or other maintenance for the clamp in the track.

* * * *

Preparing for Higher Speeds in Germany

The plans of the German State Railway for the introduction of light high speed trains on 22 different routes covering a total length of about 9,270 km., to which enterprise we have already drawn attention, have raised a number of problems connected with permanent way and signalling. The realignment of curves and junctions to reduce speed restrictions to a minimum is being undertaken on a comprehensive scale, and the present minimum radius of 190 m. for turnouts taken by expresses will soon have been altered to 500 m. in most cases, though a 300 m. radius will be used where the larger one is not possible. A design for a pair of points with 1,200 m. radius is in preparation. Since 1927 about 10 million Marks annually have been set aside for these track modifications. It is the curves, more than anything else, which determine the average speeds which can be obtained and all are being altered so as to allow of at least 5 k.p.hr. more than at present. By improved drainage, ballasting and track strengthening generally, speeds of 100, 120, 140, 160, and 200 km.p.h. will be permitted on curves of 400, 600, 800, 1,000 and 1,600 m. radius respectively. To reduce rail joints longer rails are being adopted. Rails 30 m. long are to be laid on 10,458 km. of track of which 6,200 km. is already so equipped. Even longer rails are being used experimentally, as has already been recorded in these pages, for it is felt that the reduction of rail joints to a minimum will contribute greatly to the smooth running of the new high speed trains as well as to the reduction of maintenance costs.

* * * *

Railway Locomotive Department Costs

Dealing recently with the subject of locomotive departmental costs, our American contemporary, the *Railway Mechanical Engineer*, remarked that three of the largest items of railway operating expense, *i.e.*, locomotive repairs, locomotive fuel, and enginemen's wages, relate directly to steam locomotives, and altogether represent 25 per cent. of the money spent in railway operation. Locomotives placed in service within the past ten years have demonstrated conclusively that they can be maintained for considerably less than older types. Analyses of the repair cost of more than 10,000 engines indicate that a 20-year old locomotive costs nearly twice as much to repair per potential working unit as one three years old, and more than four times as much as a locomotive just installed in service. What is true of the engines themselves is equally true concerning repair facilities. The problem of future economy in locomotive repair work is one that can best be approached by a consideration of the desirability of consolidating facilities and concentrating labour operations at centralised plants where the volume of work will be sufficient to enable the railways to take advantage of the potential economies of modern repair equipment. What assurance, it is asked, is there that by 1938 the locomotive repair bill will not represent a greater proportion of total operating expenses than it did in former years? Certainly this will happen unless measures are taken to effect improvements in keeping with those already made in other phases of railway operation.

The Cheltenham Flyer

AN event of unusual interest happened on the Great Western Railway on Thursday, April 26, when, as noted briefly in our news columns, the Cheltenham Flyer made its 500th run from Swindon to Paddington on its present timing of 65 minutes. It was in 1923 that a timing of 75 min. for the 77·3 miles was introduced, and entitled the G.W.R. to claim the fastest daily railway journey in Great Britain. After withdrawal for nine months in the winter of 1928-1929, the train was reintroduced in the summer of 1929, on a timing of 70 min., which was the fastest then operating in any part of the world. Shortly afterwards, the competition between the Canadian National and Canadian Pacific Railways led the latter to introduce a schedule of 108 min. over the 124 miles between Smith's Falls and Montreal West, on the Toronto-Montreal service, at a start-to-stop average of 67·8 m.p.h., beating the Great Western figure of 66·2 m.p.h., and in 1931, therefore, in order to regain world supremacy, the G.W.R. accelerated the Cheltenham Flyer to a run of 67 min., which brought the average speed up to 69·2 m.p.h. So the time remained until the introduction, on September 12, 1932, of the present 65-min. booking, which gives a start-to-stop average of 71·4 m.p.h. The Cheltenham Flyer is still the fastest steam-hauled train in the world; incidentally, the cessation of the Canadian competition previously referred to, by the institution of pooled working, has resulted in a considerable deceleration of the Montreal-Toronto services by both companies, the nearest speed competitor being now the non-stop steam service of the German State Railway from Berlin to Hamburg, allowed 153 min. for the 178·1 miles, which represents a start-to-stop average of 69·8 m.p.h. World supremacy in railway speed has also passed into German hands, the diesel-electric Flying Hamburger railcar being now booked over the Berlin-Hamburg course in 138 min., at an average of 77·4 m.p.h. from start-to-stop.

The Cheltenham Flyer, since its last acceleration, has proved an extremely popular train, and is probably the only train in the world—certainly the only train in Great Britain—in connection with which special daily excursion facilities have been granted, solely in order that excursionists may sample the excitements of high speed railway travel. Since September, 1932, it is estimated that roughly 50,000 persons have travelled by this express; the original six-coach formation has grown to seven coaches daily, and extra vehicles are frequently attached at week-ends in order to meet traffic demands. Not only so, but this high speed schedule has proved perfectly practical, and the Cheltenham Flyer is one of the most punctual trains on the Great Western system. A letter reproduced in our correspondence columns of the March 30 issue from a correspondent who is a well-known authority on railway speeds, showed that on 24 runs made consecutively by him on this train, at approximately fortnightly intervals, there has been only one case of appreciably late running, which was due to thick fog in the Thames Valley; even then, with the safeguard of automatic traffic control, the journey was completed at an average of over 60 m.p.h., in 75 min. 42 sec. Apart from this there was one case in which a loss of 1 min. 26 sec. was more than accounted for by signal checks; and on but a single run was there any time lost by locomotive, amounting to no more than 65 sec. The average running time of the 23 trips, omitting the journey delayed by fog, worked out at 64 min. 22 sec., and the average net time, with allowance for signal or permanent way delays, 63½ min.

The fastest run on record with the Cheltenham Flyer, and, so far as can be ascertained, the fastest journey which has ever yet been made with steam transport, was on June 6, 1932, when the 77·3 miles from Swindon to Paddington were covered in 56 min. 47 sec., start-to-stop, at an average of 81·68 m.p.h. On this occasion an average speed of 87·5 m.p.h. was maintained for 70 miles continuously, and for 28 miles continuously the speed was at or over the 90 m.p.h. level, with a maximum of 92·3 m.p.h. On several other occasions the journey has been made in less than the hour, and high speeds are frequently attained in normal service; indeed, it is a difficult matter to keep time unless a maximum of at least 80 m.p.h. is attained on some portion of the journey. Recent feats of speed which have come under our notice include a time of 24 min. 46 sec. over the 35·6 miles from Shrivenham to Reading, involving an average speed of 86·4 m.p.h. throughout, and a maximum of 90 m.p.h. at Didcot; and another run in which Slough, 58·8 miles from Swindon, was passed in 44 min. 24 sec. from the Swindon start, with a maximum of 88 m.p.h. at Didcot, so that an arrival in Paddington in 59 min. would have been easily possible. But in both cases the engine (No. 5007, *Rougemont Castle*, with a 7-coach load of 220 tons tare and 235 tons gross) was greatly eased in the final stages of the journey, in order to avoid too early an arrival. The actual 500th run, on April 26, had no features of special note; with a load of 224 tare and 240 gross tons, No. 111, *Viscount Churchill* (rebuilt as a "Castle" class 4-6-0 from the old 4-6-2 engine, *The Great Bear*), completed the journey of 77·3 miles in 62 min. 40 sec., with no checks at any point, and a maximum speed of 84½ m.p.h. at Wantage Road. Such are the standards of speed which have now been set up, that a run of this description may be described as merely "ordinary."

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Charges on "Ad Valorem" Basis

THE Railway Rates Tribunal, as briefly noted last week, gave judgment on April 24 on an application under section 37 of the Road and Rail Traffic Act, 1933, by the four group railway companies, the Mersey Railway Company, and the London Passenger Transport Board for approval of a charge agreed by them with F. W. Woolworth & Co. Ltd., for the carriage of merchandise sent for sale or use at their stores between February 1 and December 31, 1934, the charge in question being the payment of £4 5s. per cent. of the purchase price paid by the firm. The introduction of an agreed charge on an "ad valorem" basis has aroused a considerable amount of interest in trading and industrial circles as it constitutes a distinct innovation so far as railway charges are concerned. It should be pointed out, however, that the same principle is already in operation in the case of certain road hauliers, one of whom appeared before the Tribunal for the purpose of opposng the railway companies' application.

In giving judgment the President indicated that Woolworth & Co.'s business is of a somewhat unique nature. The company possesses 513 stores, situated throughout the country, where a very large variety of articles is sold at prices not exceeding 6d. each. These articles are purchased from upwards of 2,000 suppliers, and nearly the whole of the goods are sent direct to the stores at which they are to be sold. The average daily number of consignments passing from the suppliers to the stores is about 8,000 and nearly 90 per cent. of these weigh 3 cwts. or less. The percentage of 4·25 on the total purchase price of the goods was arrived at on the basis of the firm's total transport costs, and after experience had been gained of utilising an "ad valorem" basis during the years 1932 and 1933. The application of the railway companies was opposed before the tribunal by representative bodies of traders on a number of grounds including

(1) that the adoption of such an agreed charge prevented a competing trader from making a comparison with the charges paid by him: (2) that the charge would be such an advantage to Woolworth & Co. that other traders would be subject to unfair competition; and (3) that, if the charge were approved, it would result in widespread applications by traders for the introduction of a similar charge in respect of their traffic, which, if successful, might adversely affect railway net revenues and, if unsuccessful, would necessarily create a large body of aggrieved traders.

After dealing with these points, the President stated that the Court had reached the conclusion that the objects to be secured by making the agreed charge could not be secured by the grant of exceptional rates, and that the railway net revenues might reasonably be expected to be greater if the charge were approved. So far as was concerned the possibility that the business of other traders might be affected detrimentally, the Court was of opinion that any such detrimental effect was likely to be neither so great nor so widespread as to justify it declining to approve the charge. Moreover, he pointed out that any such adverse effect could be corrected or alleviated in appropriate cases under the provisions of section 37 (6) of the Act and, having regard to all the circumstances, the Tribunal approved the charge. While this decision will remove another anomaly which previously existed between the charging powers of the railway companies and road hauliers, it should be emphasised that Woolworth & Co.'s business is of a peculiar nature, and it seems somewhat improbable that the "ad valorem" system of charging will be suitable for extensive adoption.

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Keeping Indian Locomotive Design Up to Date

OF the more important decisions arrived at by the Indian Locomotive Standards Committee in the course of the year 1932-33, the first took the form of a recommendation that roller bearings should be given an early trial for the carrying axles of the new standard locomotives and tenders. In a country like India where intense heat is generally associated with at least intermittent running in an atmosphere heavily charged with dust, and often fine sand, it is only to be expected that axleboxes of the ordinary type should tend to heat to an extent unknown in more temperate climates. There seems therefore, to be an unusually promising field for the roller bearing box in such a country on this ground alone, and apart from its many other obvious advantages. The Committee also recommended that mechanical stokers should be provided for locomotives with large grate areas, a wise and humanitarian decision in view of the climate and of the fact that some of the new standard areas exceed 50 sq. ft. This recommendation is already bearing fruit in the fitting of stokers to the new Nizam's State Railways, 2-8-2 type locomotives described in THE RAILWAY GAZETTE of March 31 and April 7, 1933, and also to some of the older 2-10-0 goods locomotives on the Great Indian Peninsula as recorded in our issue of April 6 last. Another important suggestion adopted by the committee was for a standard drive for Caprotti and R.C. (Lentz) valve gears. As a result of dynamometer car trials with XS (4 cylinder 4-6-2) and converted 2-8-0, B.E.S.A. locomotives, extended use of rotary cam poppet valve gear on new engines and of piston valves with a longer travel on the converted goods locomotives was advocated. This is the first intimation we have had of trials with long travel piston valves in India and, as was to be expected, they have evidently been successful.

Modern Passenger Coach Construction

AFTER the disastrous accident at Lagny near Paris last December, when an express consisting of all-steel coaches hauled by a heavy locomotive ran at high speed into and ploughed through the rear vehicles of a slowly moving train of lightly constructed, wooden-bodied coaches, controversy over the relative merits of metal versus wooden-bodied stock became acute. The contributions of extremists on each side are of little value, for they tend to neglect consideration of the many variations of conditions under which accidents may happen, and ignore the different designs that may be adopted for both wooden and steel construction. Assuming that precautions against accident are as highly developed as possible, there still remains some risk, and the kinds of accident which may occur are so various that circumstances are conceivable in which casualties might be fewer with wooden-bodied than with all-steel stock. If, for example, the slowly moving train at Lagny had been empty, there would not have been any fatalities at all, for there were none in the all-steel express. The comparatively gradual stoppage of the latter contributed largely to the almost complete immunity of those on board, whereas, if it had been more suddenly pulled up by running into another all-steel train, it is likely that many of its passengers would have suffered at least serious injury. On the other hand, had the crowded slowly moving train been of all-steel construction, those in it would not have been slaughtered as they were. Conversely, had the high speed express consisted of wooden coaches, it is probable that there would at least have been some telescoping with fatal consequences.

All-steel stock, besides possessing the advantage of great strength, is fireproof, but it is generally heavier and more costly to build, as well as more expensive to move—because of its weight—than wooden-bodied stock. Recent progress in research and design, however, has pointed the way to the reduction, if not actually the elimination, of these disadvantages. By careful design, the adoption of welded instead of riveted joints, and the judicious use of light alloy metals, a reduction in weight of as much as 25 per cent. without loss of strength can be achieved. In America and on the Continent of Europe practically all new passenger stock is of all-steel construction—by which, of course, is meant that the underframe and the body frame and shell are of steel, though interior fittings and other lightly stressed parts may be of light metals or even of wood—but in this country our main line railways adhere generally to the principle of mounting wooden bodies on steel underframes, a type of construction sometimes conveniently referred to as semi-steel. As a rule the timber-framed bodies are panelled outside with sheet steel, which adds to the strength, and the ends and buffing gear are extra-strongly designed to reduce the risk of telescoping in case of collision.

This type of construction has important advantages, foremost among which are light weight and economical construction and maintenance. A further advantage claimed is that in the event of accident the timber body members can be easily cut or broken through to release passengers trapped in the wreckage. On the other hand, it has to be admitted that the wreckage would probably be less in the case of all-steel stock, and, further, modern breakdown equipment includes burners and pneumatic tools for quickly cutting through metal, as described in an article we published in our issue of February 23 on the breakdown-train arrangements of the German State Railway. As an example of up-to-date British railway carriage construction on the semi-steel principle, we would refer our readers to the detailed article on pages 787-795.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of Correspondents)

Safe Speeds and Axle Loads on Colonial Narrow Gauge Railways

Saffron Walden.
April 17

To the Editor of The Railway Gazette

Sir,—May I have space in which to comment upon the question of axle loads, which were mentioned, among other items, by Mr. Bulkeley in his most interesting letter in The Railway Gazette of April 13? My comment refers to the curious and persistent prevalence of unbalanced or partially balanced forces due to the direct drive of the normal locomotive, with its comparatively slow speed and massive engine parts; if the drive were geared, these very destructive forces would disappear, and by raising the revolution-speed of the engine its weight could be materially reduced; enclosed self-lubricated engines would also be a possibility, effecting a great economy in what is known as " preparation-time " as well as lubrication. The absence of these forces would admit of a heavier axle load without ensuing damage and it is curious that railway civil engineers have not insisted on it a long time ago. It is always a source of annoyance to me when I see a Sentinel railcar to reflect that a former steam wagon building firm has shown locomotive engineers what to do and how to do it in this connection.

Yours faithfully,
J. G. B. SAMS

Footwarmers

Bordyke,
Burgess Hill, Sussex.
April 2

To the Editor of The Railway Gazette

Sir,—A letter from the Rev. Reginald B. Fellows in The Railway Gazette of March 30 quoted a passage from MacDermot's " History of the Great Western Railway," showing that footwarmers were introduced for first-class passengers on the line in 1856. *Herapath's Railway and Commercial Journal* for January 17, 1852, reproduces the following from *The Times*: " The Great Northern Railway. The comfort of passengers by this line has been greatly increased this winter by the introduction of foot-warmers into all first class carriages in the ' through ' trains."

The G.N.R. had been opened for a few months from a temporary station at York Road, King's Cross, and possibly footwarmers had been provided as an inducement to passengers to transfer from the established L.N.W.R. route. The paragraph does not give the impression that footwarmers were then quite a novelty. *Herapath* does not comment on it, as it probably would, had such been the case, nor, so far as my research shows, did the G.N.R. refer to the matter. It looks, therefore, as though footwarmers were already in use on railways in 1851, and possibly earlier.

Yours faithfully,
G. A. SEKON

A Suggestion for Simplified Train Services

4, Limerick Road, Redland,
Bristol, 6.
April 17

To the Editor of The Railway Gazette

Sir,—Referring to Mr. Pownall's letter in your issue of March 16, I had already taken the opportunity of perusing the pamphlet which he has issued upon this subject. The novel scheme propounded therein has some very grave objections, viz.:—

(*a*) One proposal is for the building of an entirely new system of lines converging on certain centres, along which " mixed " trains will run at a uniform speed of 80 miles an hour. We are not told the terrible fate which awaits the present railway system, neither are any suggestions given as to how the proposed straight line from Brecon to Aberystwyth, for example, is to overcome the 3,000 ft. mountains intervening.

(*b*) In addition to an entirely new railway system, we are to have a network of aqueducts at a uniform height of 300 ft. Propulsion on these will be by means of a wheel device engaging with two concrete " rails " to be placed in the bed. The aqueducts are also to serve as sewers for the disposal of trade refuse, &c.

Unfortunately, as in many previous schemes, a conveniently blind eye has been turned to the financial aspect, and it would be enlightening to know the source of the immense capital necessary to turn such terrifying proposals into concrete facts.

Yours faithfully,
C. R. CLINKER

The Signal Engineer's Department

London.
April 24

To the Editor of The Railway Gazette

Sir,—As yet all reference in the discussion on the signal engineer's department has been made to overseas and Colonial railways, but as Mr. G. V. O. Bulkeley has particularised by giving as an example the Nigerian Railway I trust I shall be excused if I give further particulars, suggestions and advice concerning this railway.

The Nigerian Railway consists of 1,770 miles of track, upon which travel nearly 300 locos and some 4,500 vehicles. It is one of the most extensive lines in any of the Crown Colonies and is financially sound. As mentioned by Mr. Bulkeley, it is a single track railway employing the electric train staff system for control and operation of the single line sections. I would add that tablet instruments are used for single line work and block apparatus where there is double track. Mr. Bulkeley furthermore admits that the railway relies on signalling instruments for safe operation and as a secondary precaution on more signalling apparatus. He therefore has that much confidence in signalling.

The responsibility of supervising a single-line system of 1,770 miles is great, for it must be remembered that single-line work presents a difficult problem at all times and even more so when those in charge have to deal with the native element for operation and presumably maintenance. A grave responsibility rests upon the management when it allows those with little experience of signalling to take charge. Railwaymen cannot be experts in all the trades and professions involved in railway maintenance and, therefore, it is unwise to hand the responsibility of signalling, however simple, to those officers (railway or non-railway) who are not trained signal engineers. One can never hope for satisfactory and economic results from officers and engineers who possess little knowledge of the subject they are dealing with. To be economic, signalling must be in the hands of specialists.

Then again, the Nigerian Railway possesses communications in the form of telegraphs and telephones. An up-to-date signal engineer has knowledge and experience of electrical and mechanical signalling, telegraph and telephone work. Possessing such an officer (namely a signal and telegraph engineer) the railway management would be sure of thorough satisfactory and safe signalling and communica-

tions. Working, perhaps, with a signal and telegraph department he would provide the economic and good signalling which is essential for the safe and speedy movement of trains. Signalling would become a means whereby operating expenses could be reduced, besides providing further safety and greater facilities for railway communications. A signal department would justify its existence not by elaborate and expensive schemes but by giving every facility and advantage for reliable and economic railway operation and maintenance, plus safety and security.

Yours faithfully,

" HOME FROM THE COLONIES "

London, April 24

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I am afraid your correspondent "Signalling Manufacturer" of April 10 has forgotten that all branches which co-operate in effecting railway signalling, *i.e.*, the "Traffic," the "Signal Engineer" and the "Manufacturer," are interdependent and are essential in providing economical and safe signalling. One without the other would be useless; were it not for the "Traffic," developments and new styles of signalling would not be called for and the necessity for the Signal Engineer would not exist. Were it not for the Signal Engineer and the "Traffic," the manufacturer would not be required to produce signal apparatus.

It is incorrect besides being unfair to suggest that the manufacturer of signalling apparatus is the Signal Engineer and that the Railway Signal Engineer is required only for installation and maintenance purposes. It is the collaboration of the "Traffic," the Signal Engineer and the manufacturer, which produces efficient and economic signalling suitable for railways allowing of inexpensive running, maintenance and operation with the highest degree of safety and security.

Might I also point out that the majority of manufacturing engineers are largely recruited from Railway Signal Departments in the same way as Railway Signal Engineers are largely enlisted from signalling manufacturers.

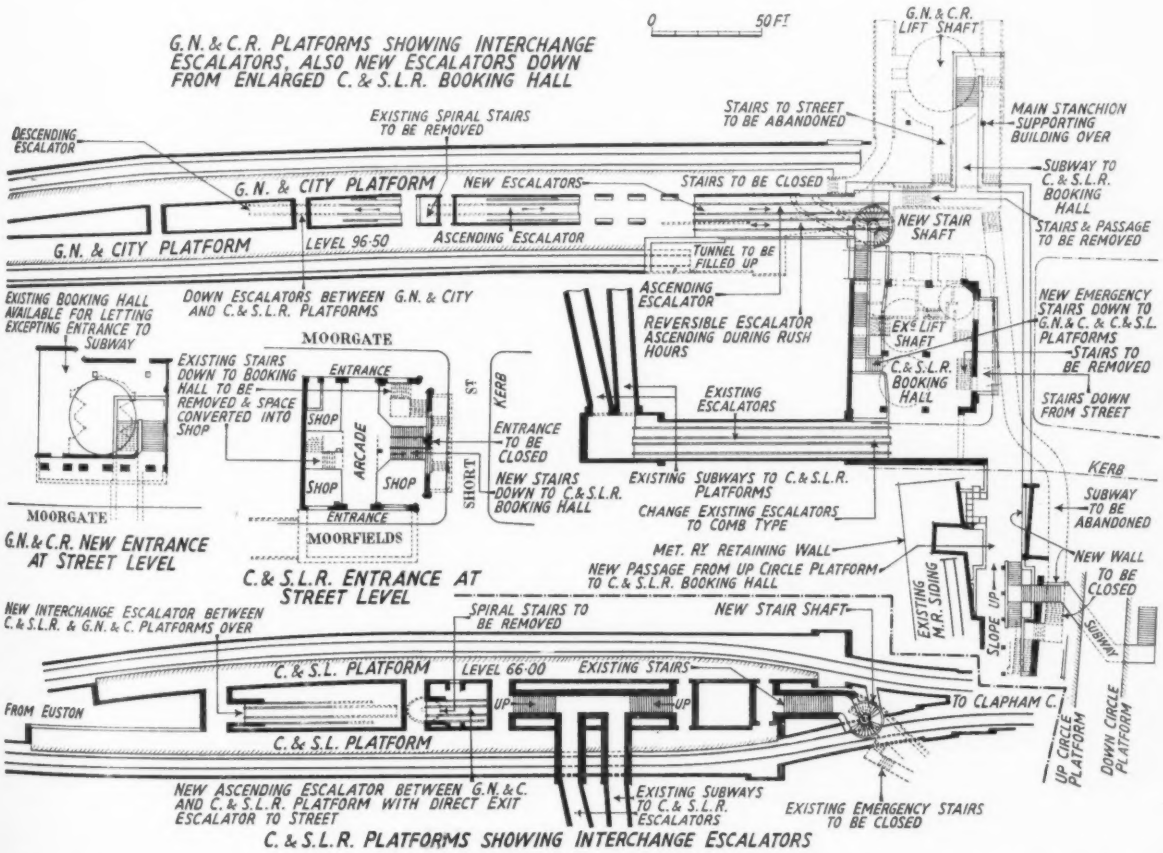
"Signalling Manufacturer" should also know that, besides having as its President for this year a signal manufacturing engineer, the Institution of Railway Signal Engineers showed its appreciation and recognition of manufacturers three years ago when for the first time it elected as President a member of a world famous firm of manufacturers of electrical and mechanical signalling.

I agree, however, that great credit is to be given to manufacturers of railway signalling apparatus, for perfecting apparatus suitable for all conditions as required by home, overseas and foreign railways. They have greatly assisted in making railway travel safe and economical, but this has only been made possible by the Signal Engineer, the "Traffic" and the manufacturer pooling their knowledge and experience.

Yours faithfully,

" SAFETY "

Proposed Station Linking up at Moorgate


G.N. & C.R. PLATFORMS SHOWING INTERCHANGE ESCALATORS, ALSO NEW ESCALATORS DOWN FROM ENLARGED C. & S.L.R. BOOKING HALL
0 50 FT
G.N. & C.R. LIFT SHAFT
EXISTING SPIRAL STAIRS TO BE REMOVED
STAIRS TO STREET TO BE ABANDONED
MAIN STANCHION SUPPORTING BUILDING OVER
DESCENDING ESCALATOR
G.N. & CITY PLATFORM
NEW ESCALATORS
STAIRS TO BE CLOSED
SUBWAY TO C. & S.L.R. BOOKING HALL
NEW STAIR SHAFT
STAIRS & PASSAGE TO BE REMOVED
LEVEL 96·50
ASCENDING ESCALATOR
TUNNEL TO BE FILLED UP
EXISTING BOOKING HALL AVAILABLE FOR LETTING EXCEPTING ENTRANCE TO SUBWAY
DOWN ESCALATORS BETWEEN G.N. & CITY AND C. & S.L.R. PLATFORMS
ASCENDING ESCALATOR
REVERSIBLE ESCALATOR ASCENDING DURING RUSH HOURS
NEW EMERGENCY STAIRS DOWN TO G.N. & C. & C. & S.L. PLATFORMS
EXISTING LIFT SHAFT
STAIRS TO BE REMOVED
MOORGATE
EXISTING STAIRS DOWN TO BOOKING HALL TO BE REMOVED & SPACE CONVERTED INTO SHOP
ENTRANCE
SHOP
ARCADE
SHOP
SHOP
ENTRANCE
ST
KERB
ENTRANCE TO BE CLOSED
SHORT
C. & S.L.R. BOOKING HALL
EXISTING ESCALATORS
STAIRS DOWN FROM STREET
NEW STAIRS DOWN TO C. & S.L.R. BOOKING HALL
EXISTING SUBWAYS TO C. & S.L.R. PLATFORMS
CHANGE EXISTING ESCALATORS TO COMB TYPE
KERB
SUBWAY TO BE ABANDONED
MOORGATE
MOORFIELDS
G.N. & C.R. NEW ENTRANCE AT STREET LEVEL
C. & S.L.R. ENTRANCE AT STREET LEVEL
MET. RY. RETAINING WALL
NEW PASSAGE FROM UP CIRCLE PLATFORM TO C. & S.L.R. BOOKING HALL
NEW WALL TO BE CLOSED
NEW INTERCHANGE ESCALATOR BETWEEN C. & S.L.R. & G.N. & C. PLATFORMS OVER
SPIRAL STAIRS TO BE REMOVED
NEW STAIR SHAFT
EXISTING M.R. SIDING
SLOPE UP
SUBWAY
C. & S.L. PLATFORM
LEVEL 66·00
EXISTING STAIRS
UP
UP
TO CLAPHAM C.
FROM EUSTON
C. & S.L. PLATFORM
UP CIRCLE PLATFORM
DOWN CIRCLE PLATFORM
NEW ASCENDING ESCALATOR BETWEEN G.N. & C. AND C. & S.L.R. PLATFORM WITH DIRECT EXIT ESCALATOR TO STREET
EXISTING SUBWAYS TO C. & S.L.R. ESCALATORS
EXISTING EMERGENCY STAIRS TO BE CLOSED
C. & S.L.R. PLATFORMS SHOWING INTERCHANGE ESCALATORS

General arrangement of the important improvement scheme, which, as announced in our issue of March 9, the London Passenger Transport Board has arranged to carry out in order to improve the interchange facilites at its Moorgate stations

PUBLICATIONS RECEIVED

Cornwall at Work.—By Ashley Brown. London: Great Western Railway Company, Paddington Station, London, W.2; 57 pages, price 1s.—There are seven chapters in this entertaining little work and each of them very clearly deals with some aspect of industry more particularly associated with Cornwall—such as china clay, tin, fish, flowers, broccoli and potatoes. Each chapter is faced with a fine, full-page illustration, suitable to its subject matter, and there is, in addition, a frontispiece showing the picturesque village of Bodinnick, near Fowey. Copies are obtainable through booksellers and G.W.R. bookstalls.

Murder on the Orient Express. By Agatha Christie. London: W. Collins, Sons & Co. Ltd., 48, Pall Mall, S.W.1. 7½ in. × 5 in. 254 pp. Price 7s. 6d. net. **Stamboul Train.** By Graham Greene. London: William Heinemann Limited, 99, Great Russell Street, W.C.1. 7½ in. × 5 in. 307 pp. Price 7s. 6d. net.—The one thing in common between the Orient Express of Mrs. Agatha Christie and that of Mr. Graham Greene is the Athens slip coach. In this respect Mrs. Christie is in some respects the more serious transgressor, for while Mr. Greene refers to the through portion in question as the slip coach *for* Athens, Mrs. Christie, whose characters are travelling in the opposite direction, crosses the bounds of possibility entirely by calling it the slip coach *from* Athens. Against this must be set the fact that Mr. Greene's train does not actually carry Athens coaches at all. But the two authors have looked at the Orient Express from different angles. Mrs. Christie sees it as a convenient site for another of her admirably conceived murders. To Mr. Graham Greene it is a "Grand Hotel" on wheels. He peoples it at Ostend with a variety of unprepossessing travellers, and tells the story of what befell them on the way to Istanbul. By its route, his train is the Ostend–Vienna–Orient express, but he endows it with strange rolling stock. Mrs. Christie chooses a safer course. She runs her Orient Express, actually the Simplon-Orient, into a Jugoslavian snowdrift, a device which not only saves her from further embarrassment over details of its progress, but complicates the mystery surrounding the death of Mr. Samuel Ratchett, alias Cassetti, American kidnapper and thug. The train numbers among its passengers Mrs. Christie's redoubtable detective, M. Hercule Poirot, who furnishes as satisfactory a solution of the crime as ever. If there is a weakness in the story at all it is in the assumption that a snowdrift could completely isolate three coaches of a train, even admitting, to quote a character in the book, that "after the service of dinner the door between the ordinary carriages and the sleeping cars is locked," especially as there are no ordinary carriages on this de luxe express. The entire absence of effort to release the train from its *impasse* is also a little surprising.

Mr. Graham Greene, apparently, wishes to remind his readers that man is mainly vile, and his creations have in consequence some of the gloomy qualities of the "dim blue globes" and "unsteady lamps" which light the corridors of the Orient Express in his book. But he gives us plenty of incident, ranging from an abortive revolution in Belgrade to the exploits of an embittered and drunken woman journalist in search of a story. The author has some strange misconceptions. He says such things as, "a long whistle of steam blew through an exhaust," and later, "in the coach the pressure gauge rose, the driver turned the regulator open and the speed of the train was increased by five miles an hour." Again, first class sleeper passengers are obliged to bribe the "guard" to secure a compartment to themselves. Signal-boxes in Hungary are a further flaw in his local colour. But "Stamboul Train" is a work of imagination and power, and if we should hesitate to choose any of Mr. Greene's characters as a travelling companion it is only because exuberance has made him overdraw them.

Cross-Channel and Coastal Paddle Steamers. By Frank Burtt. London: Richard Tilling, 104, Great Dover Street, S.E.1. 8½ in. × 5½ in. × 1½ in. 440 pp. (Illustrated.) Price 15s. 0d. net.—In view of the important part which British railways have played for so many years in the maintenance of cross-Channel services, a considerable portion of this interesting volume is devoted to railway-owned steamers. These vessels are, of course, mainly of the last century as the life of the paddle steamer for general service is long since past, although it is by no means obsolete for use on rivers, lakes, and other inland waterways, and in special conditions where shallow draught or ease of manœuvring require its peculiarities. So long as there are any paddle steamers afloat they will continue to exercise a peculiar fascination upon a large section of the travelling public, and it is with a view to meeting the requirements of such persons that the author has prepared the present volume, which has some 90 illustrations, including a three-colour frontispiece.

He has not attempted to weld his facts into a narrative which may be read at one sitting, but in preference has set up in easily accessible form such details as he has been able to obtain on all paddle steamers which are, or have been, engaged on cross-Channel or coastal service around the British Isles. In so doing he has compiled a reference work which should be of considerable value. The chapters of particular railway interest are those devoted to the G.E.R.; M.S. & L.; L.S.W.R.; G.W.R.; L.N.W.R.; L. & Y. and L.N.W.R. joint; early Kentish cross-Channel services; separate chapters on the Ostend-Dover, Folkestone-Boulogne, Dover-Calais, and Newhaven-Dieppe routes; and the Larne-Stranraer service. Although the author's primary object has been to produce a reference work, its pages are by no means devoid of general interest, and the volume is one into which it is very easy to dip time and again and still find new interest.

Holidays on the Continent.—Dean & Dawson Limited sends a programme of Continental holiday tours for 1934. These include both escorted and independent travel facilities, combined cruise tours, and short sea cruises. Reduced charges are a feature of this year's arrangements. Inclusive nine-day holidays are offered on the French Riviera and in Switzerland at the cost of rail and boat fare only. Travellers who wish to go further afield than the usual tourist centres, all of which are adequately covered by the arrangements described in this book, will be interested in conducted tours to Dalmatia and Jugoslavia and combined cruises and land tours to the North African coast.

Fans and Air Heaters.—The Blackman Export Co., Ltd., sends three leaflets describing Blackman multivane centrifugal fans, air heaters and warm air units. The range of centrifugal fans is for belt drive and the mounting of the driving pulley in all sizes is either overhung or between the pedestal bearings according to the capacity required. Movable discharge is provided in the smaller sizes. The sectional air heaters are supplied with steel or copper gilled tubes, each type being available in 100 sizes. The sections can readily be bolted together to form a heating battery. The warm air units comprise an electric fan and electrically heated elements. The fan can be used without the heater when required. The units are very quiet in running, and easily fixed or suspended in any situation.

Valves, Cocks and Fittings.—Newman, Hender & Co. Ltd., of Woodchester, sends a new catalogue (No. 54) of valves, cocks and fittings. It is bound in stiff covers and contains 206 pages, dealing with the firm's principal manufactures, and including a short account of its history. A series of views of the Woodchester works prefaces the publication. The catalogue is copiously illustrated, and examples of many of its ranges of products are shown in full-page sectional diagrams in colour. Among the wide variety of boiler fittings listed are pressure and water gauges, lever, spring and pop safety valves, injectors and ejectors, and whistles. There is a complete alphabetical index to all ranges of goods shown and a numerically arranged index to the key numbers of individual items.

THE SCRAP HEAP

COCKNEY HUMOUR AT A RAILWAY STATION

At about 3.10 p.m. on Saturday last, the day of the Cup Final at Wembley, two typical Londoners were standing on the down main line departure platform at Paddington station. Just at this time that very exceptional crash of thunder occurred and one wondered whether London was falling down. One of the Cockneys was heard to say to the other: "Did you hear Portsmouth scoring that first goal?"

* * *

RAILWAY SANDWICHES DE LUXE

Because railwaymen, and often their children have to take their lunches with them, the *Canadian National Railways Magazine* has inaugurated a "brighter sandwiches" competition. Among the entries in the section for school lunches, the following "fillings" have been submitted:—chopped dates and nuts moistened with orange juice; chopped figs, dates and nuts, moistened with lemon juice; peanut butter and orange marmalade; minced ham, hard boiled egg yolk and mayonnaise, butter or cream; chicken, minced, celery and green peppers moistened with cream or mayonnaise; broiled bacon, ground, and peanut butter moistened with milk; cottage cheese and chopped dates; egg yolks, hard boiled, chopped, and flaked sardines moistened with lemon juice; and fried liver and bacon, finely chopped and mixed with a little pickle. Now who will turn up his nose at a "railway sandwich"!

(*See editorial note on page* 775.)

* * *

SOUTH AFRICAN GOVERNMENT RAILWAYS
LOCOMOTIVE CLASSIFICATION

Class.		Class.		Class	
1	4-8-0	10	4-6-2	16C	4-6-2
1A	4-8-0	10A	4-6-2	16D	4-6-2
2	4-6-2	10B	4-6-2	16DA	4-6-2
2C	4-6-2	10C	4-6-2	17	4-8-0
3	4-8-2	11	2-8-2	18	2-10-2
3B	4-8-2	12	4-8-2	19	4-8-2
4	4-8-2	12A	4-8-2	19A	4-8-2
4A	4-8-2	12B	4-8-2	19B	4-8-2
5	4-6-2	13	4-8-0	19C	4-8-2
5A	4-6-2	14	4-8-2	A	4-8-2T
5B	4-6-2	14A	4-8-2	C	4-6-0T
6-6L (There are no classes 6F, 6I and 6K)	4-6-0	14C	4-8-2	C1	4-6-2T
6Y	2-6-2	15	4-8-2	D	2-6-4T
6Z	2-6-4	15A	4-8-2	E	4-6-4T
7-7F	4-8-0	15B	4-8-2	G	4-8-2T
8-8F	4-8-0	15CA	4-8-2	H1	4-8-2T
8R	4-8-0	15CB	4-8-2	H2	4-8-2T
8X	2-8-0	16	4-6-2	J	4-6-4T
8Y	2-8-0	16A	4-6-2	K	4-6-4T
8Z	2-8-0	16B	4-6-2	S	0-8-0

Garratts		Modified Fairlies	
GA	2-6-0 + 0-6-2	FC	2-6-2 + 2-6-2
GB	2-6-2 + 2-6-2	FD	2-6-2 + 2-6-2
GC	2-6-2 + 2-6-2	GH	4-6-2 + 2-6-4
GCA	2-6-2 + 2-6-2	HF	2-8-2 + 2-8-2
GD	2-6-2 + 2-6-2	Mallets	
GDA	2-6-2 + 2-6-2	MC	2-6-6-0
GE	2-8-2 + 2-8-2	MC1	2-6-6-0
GF	4-6-2 + 2-6-4	ME	2-6-6-2
GG	2-6-2 + 2-6-2	MF	2-6-6-2
GK	2-6-2 + 2-6-2	MH	2-6-6-2
GL	4-8-2 + 2-8-4	MJ	2-6-6-0
Garratt-Union		MJ1	2-6-6-0
U	4-6-2 + 2-6-4		

Miscellaneous Locomotives			
Exp. 1	4-6-2	O4	4.4-2
Exp. 6	4-8-0	O5	4-6-0
O3	4-4-0	SWA	2-8-0

It is a remarkable fact that, annually on the morning of April 9, the sun's rays penetrate through the great Box tunnel of the Great Western Railway, and on no other day of the year.—*From "The Daily Telegraph" of April* 12, 1859.

* * *

BRITISH MUSEUM'S SECRET

Mr. T. K. Vaughan, who for the last five years has been stationmaster at West Ealing G.W.R. station, retired recently on his sixtieth birthday, after 44 years' service. He was stationmaster at Aberystwyth when books and manuscripts were removed during the war from the British Museum to the Welsh National Library. The books remained at Aberystwyth until the end of the war without anyone, except Mr. Vaughan and a few officials, knowing the secret. "I was told that the books would arrive at Aberystwyth on a certain night in a number of special trains, and that I was to superintend their arrival," said Mr. Vaughan. "I was warned that complete secrecy was to be observed. Until the end of the war the books remained locked away in the library and not a soul knew they were there except a few officials and myself. Afterwards I received a letter of thanks from the Government."—*From the "Star."*

* * *

Teacher (in ringing tones): "'St. George for England'! Can any boy think of anything more thrilling than that?"

Small boy (at back of class): "Yessir. 'St. Pancras for Scotland'!"

* * *

Londoners who see a single-deck L.P.T.B. omnibus finished in a splendid scheme of purple, black, and orange with the name *Jye* emblazoned on the sides in standard "General" lettering, need not anticipate a revolutionary change of livery for London's omnibuses, or the introduction of individual names for each vehicle. *Jye* is a gift from Lord Ashfield to the London School of Economics, and derives its peculiar name from the nickname of Mrs. Mair, the secretary of the school, who performed the naming ceremony with the customary bottle on Saturday last. We understand that the gift is the outcome of some clever diplomacy by Mrs. Mair when Lord Ashfield delivered a lecture at the London School of Economics in March last.

RAILWAY OPERATION
A SIMPLE GUIDE FOR PERPLEXED STUDENTS!
HOW IS TRAIN APPROACHING SIGNAL APPLIED?
IN OUR GANG BILL TELLS 'ERB, 'ERB TELLS ALF - ALF TELLS 'ORACE 'ORACE TELLS ED & HE TELLS TIM & GUS
DESCRIBE THE ACTION OF A SIGNALMAN SENDING 9 BEATS TO REAR
DESCRIBE A DISTANT SIGNAL
ANSWER ONE A LONG WAY OFF
ON WHAT PRINCIPLE ARE POINTS LAID IN?
ANSWER.
3 POINTS FOR THIS
5 POINTS FOR THIS
DESCRIBE DETONATOR ECONOMISER
AS USED IN BIG BOXES.
DESCRIBE A STOP BOARD.
SLIP WORKING. DESCRIBE GUARD'S DUTIES
1 BEFORE SLIPPING.
2 WHEN ABOUT TO SLIP.
3 AFTER SLIPPING
WHAT ARE THE PROVISIONS OF RULE 72A?
ANSWER
TO KEEP SIGNAL BOX
PRIVATE NO ONE MUST ENTER.
(REPRESENTATIVES OF VACUUM CLEANER FIRMS MUST BE KEPT OUT BY FORCE)
DESCRIBE THE ACTION OF A SIGNALMAN ON RECEIVING THE "WARNING"
ANSWER
PAY THE GIPSY
IF A DRIVER SEES AN ARM IN THE "OR" POSITION WHAT IS HE TO DO?
ANSWER. BE A SPORT & SHUT UP!

A cartoon by J. S. Jenkins, of Cardiff, reproduced from the "Great Western Railway Magazine"

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Central Africa and Tanganyika Railways in 1933—New Indian standards—Combined rail and road bridge over the Little Belt—Norwegian railway extensions—Cost of living in Italy—Hopeful South African outlook—Development in the Ruhr—French results for 1933

CENTRAL AFRICA

Results for the Year 1933

It is reported by the Eastern African Trade and Information Office that the total revenue for the year 1933 on the railways under the Commissioner for H.M. Eastern African Dependencies amounts to £467,779, as against £465,674 in 1932, an increase of £2,105. As the estimated revenue for last year was only £450,000, there is an improvement upon the estimate of £17,779 or 3·9 per cent. Details of the comparative earnings are as follow:—

	1932	1933	Increase or Decrease
	£	£	£
Coaching ...	88,221	80,122	− 8,099
Goods ...	323,786	351,920	+ 28,134
Telegraphs and Sundries	46,648	28,079	− 18,569
Steamers ...	7,019	7,658	+ 639
	465,674	467,779	+ 2,105

The corresponding tonnages carried by the two railways concerned were:—

Line	Imports 1932	Imports 1933	Imports Increase or Decrease	Exports 1932	Exports 1933	Exports Increase or Decrease
	Tons	Tons	Tons	Tons	Tons	Tons
Central ...	60,432	48,566	− 11,866	62,969	69,936	+ 6,967
Tanganyika ...	23,000	26,530	+ 3,530	65,670	71,716	+ 6,046
Total... ...	83,432	75,096	− 8,336	128,639	141,652	13,013

INDIA

Railway Operating Statistics for 1932-33

The report on the working of the Indian railways in 1932-33 contains much interesting data bearing upon the scheme of job analyses inaugurated by Mr. Pope. The number of passenger-miles for the year on Class I railways was 16,891 millions, being 2·59 per cent. below the figure for the previous year. The average distance of travel per passenger was 34·3 miles against 35 in 1931-32. The net ton-mile figure was reduced by about 6·21 per cent. to 16,978 millions, while the average haul per ton of goods fell from 192 miles to 190 miles. There was an appreciable reduction in the number of train-miles run during the year to carry the above traffic. On the broad gauge the number of shunting miles per 100 train-miles passenger and proportion of mixed) was slightly reduced, but on the metre gauge there was an increase of 9·15 per cent. in this figure. In the case of goods and proportion of mixed the number of shunting miles per 100 train-miles was 1·65 per cent. higher on the broad gauge and 0·32 per cent. lower on the metre gauge.

The average through speed of goods trains shows some improvement, being 11·5 miles per train-engine-hour on the broad gauge and 10·8 on the metre gauge as compared with 11·0 and 10·5 respectively for the previous year. The figure for net ton-miles per engine-hour increased from 1,823 to 1,827 on the broad gauge and from 830 to 836 on the metre gauge. The wagon usage figures are not so satisfactory, small reductions being recorded both in the number of wagon-miles per wagon-day and in the number of net ton-miles per wagon-day. The year also recorded increases in the percentage of goods and coaching vehicles under or awaiting repairs in mechanical and transportation workshops and sick lines to the total number of such vehicles on the line. The fuel economy campaign continued to make satisfactory progress. In consequence of the continued economic depression the available wagon supply was at all times of the year in excess of the demand. As compared with 1931-32 the number of wagons loaded declined by 2·37 per cent. Coal despatches during the year were 6·24 per cent. lower.

New Standards in Permanent Way and Bridgework

During the year 1932-33 the structural branch of the Central Standards Office issued complete sets of drawings for standard over-riding switches for broad and metre gauges, which are adapted from the American model and are designed to overcome the inherent weakness of the stock rail associated with most types of switches hitherto used in India. Complete sets of drawings for 1 in 12 and 1 in 8½ broad gauge scissors cross-overs for 17 ft. and 15 ft. 6 in. track centres using 99-lb. rails, and 1 in 8½ diamond crossings with single and double slips for broad gauge 115-lb. and 90-lb. rail sections were also issued to various railways for comments and trial manufacture prior to standardisation. Designs for stretcher bars were circulated for remarks, and data were collated in India and abroad regarding the design of a suitable rolled steel section with fastenings for broad gauge crossing sleepers.

The design of broad gauge plate girder bridge spans was taken in hand and preliminary sketches showing novel methods of design whereby a span of nominal length may be used for a suitable length of span opening, were circulated for comment. By increasing the working stress to nine tons per sq. in., and an economic distribution of metal, it has been found possible to effect an average reduction of 12 per cent. in the weight of such spans with corresponding reduction in the cost.

Locomotive Developments

The Locomotive Standards Committee noted the improvement effected in the riding of the YF type locomotive as a result of recent modifications. Further modifications for trial on the XA type locomotive were proposed. The committee recommended the early trial of roller bearings for the carrying axles of standard locomotives and tenders and mechanical stokers for locomotives with large grate areas. The dynamometer car reports on the XS type locomotives and the converted 2-8-0. B.E.S.A. locomotives were examined by the committee, and the extended use of rotary cam poppet valve gear on new locomotives, and piston valves with a Lager travel on converted goods locomotives was advocated. A considerable amount of useful work was also done by the Standards Committees for Carriages and Wagons, Bridges, Tracks and Signalling and Interlocking.

[These and associated matters are also dealt with in our editorial on page 779.—Ed., *R.G.*]

DENMARK

Little Belt Bridge

Work is now well advanced upon the combined road and rail bridge which is to span the Little Belt. There will be a double track railway as well as an 18-ft. roadway and a 5 ft. 6 in. footpath. The overall length of the bridge is 3,865 ft., of which the five approach spans on the Jutland side account for 702 ft., and those on the Fünnen side for 455 ft. These approaches consist of reinforced concrete arches, five on the Jutland side and three on the Fünnen side. The five spans across the main channel are of steel through girders, the centre span being 722 ft., those on each side of it each 541 ft., and the two outer main spans 453 ft., these main spans thus being symmetrically arranged. The depth of the girders of the centre span is 79 ft., and that of

the outer spans 50 ft., while there is a clear headway of 108 ft. under the central span above mean sea level. One of the piers was sunk in as great a depth as 98 ft. of water, and weighs no less than 50,000 tons. Altogether there are 13,000 tons of steelwork in this bridge, which is estimated to cost approximately £1,000,000 sterling, and is expected to be opened on May 1, 1935. The main contractors are the Danish firm of Monberg & Thorsen, the steelwork being supplied by German sub-contracting firms.

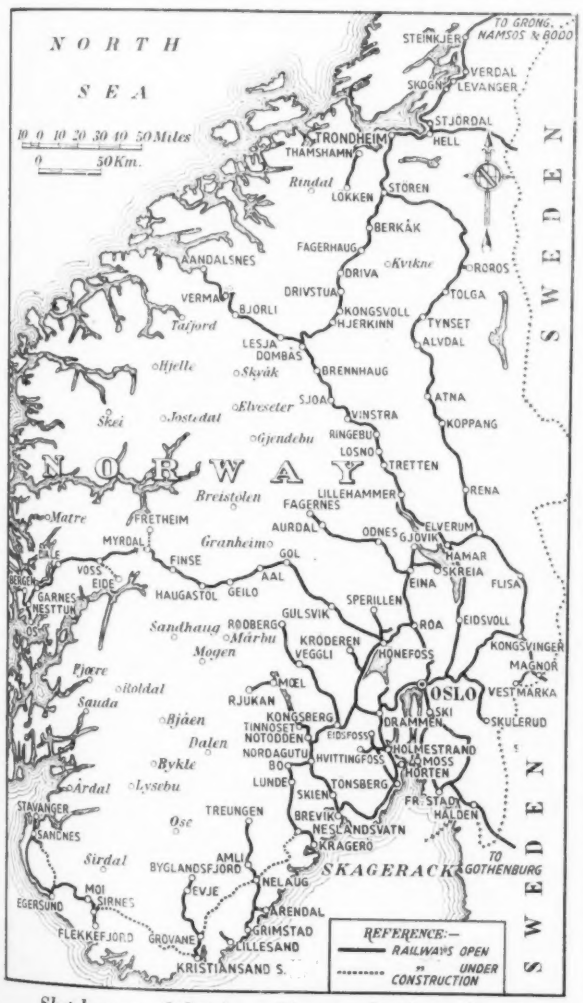
Reduction of Passenger Classes to Two

On and from May 15 there will be only two classes of passenger accommodation upon the State Railway system, the "common," or lower class, which will be included in all trains, and first class, replacing the present second class. The latter will be included only on long-distance and certain suburban trains. The lower class coaches will be unmarked. This measure, taken in connection with the release of rolling-stock from electrification, will enable four-wheeled stock to be practically eliminated from all regular services except at the peak of the rush hour. International trains, will carry first, second and third class passengers, as hitherto.

NORWAY

New Railways

Norway is one of the European countries in which railway construction is proceeding apace at the present time, and this is the more remarkable in view of the exceptional difficulty of the terrain from the engineering point of view. Hitherto connection between the capital, Oslo, and most of the towns of importance on the west coast, other than Bergen and Trondheim, has been made circuitously by water, but by extending existing lines, or constructing branches from them, various new routes are being opened, the most recent of which has been the Rauma Railway, branching from the main Trondheim line at Dombas, in the Gubrandsdal, and running down to Åndalsnes. A considerably bigger project is now under way, in the extension of the Nordland section from Grong, 130 miles north-east of Trondheim, for 250 miles northwards to Bodö, in latitude 66 deg., within the Arctic Circle, chiefly to serve the northern fishing grounds, together with a branch from Grong to the port of Namsos, one of the centres of the Norwegian lumber industry. From the Oslo-Bergen line two branches of considerable tourist importance are being thrown out, one, 16 miles long, from Voss to Eide,* giving direct railway communication between Bergen and the Hardangerfjord, and the other from Myrdal, at the east end of the Gravehals tunnel, down the spectacular Flåm Valley to Fretheim, on the Aurland branch of the Sognefjord, where a descent of 2,700 ft. in altitude in 10 miles of distance is to be overcome by spiral planning. Proposals are also on foot to connect Stavanger and Kristiansand with Oslo by linking up certain existing railways.



Sketch map of Southern Norway showing railways under construction

* An illustration of this line appeared on page 549 of THE RAILWAY GAZETTE for March 30.

ITALY

Bridge Testing by the International Engineering Congress

The International Congress of Civil Engineers and Bridge Constructors—referred to in THE RAILWAY GAZETTE of April 13—concluded its session at Stresa with practical experiments carried out with the collaboration of the State Railways. The Roddo bridge on the Simplon line and a train of loaded wagons and coaches were placed at the disposal of the Congress. The experiments were conducted by Prof. Sesini of the University of Pisa and the State Railways were represented by Comm. Ing Fava, Engineer-in-Chief of the Bridge Department of the State Railways.

The Cabinet has approved the text of the law embodying the conclusions reached at the International Congress for the Revision of the Berne Convention (C.I.M. and C.I.V.) which was held at Rome in October-November 1933.

General Reduction of Charges

In consequence of the Cabinet's decision respecting the reductions of salaries of State employees (including those of the Ministers by 20 per cent.), varying from 10 to 15 per cent., and the reductions of rents for private and business premises, the various organisations of retail traders have decided to reduce all prices by 5-15 per cent. Immediately after the Cabinet meeting the Minister of Communications ordered that all prices of goods sold by the *Provvida*—the chain of food stores run by the State Railways for the benefit of railway employees—were to be reduced by 10 per cent. The Council of the Federation of Hotelkeepers and Tourism has decided likewise to reduce the existing tariff prices for hotel rooms by 15 per cent. and all other hotel prices by 10 per cent. Also all charges made by tourist agencies (excluding railway, steamship, motor services, which are subjected to independent tariffs) have been reduced by 10 per cent. It is not generally known that all hotels and boarding houses in Italy are classified in various categories and that the maximum prices which each category is allowed to charge are fixed by the federation with the approval of the Commissary for Tourism. The new reductions in the general cost of living in Italy (which is already considerably below that of France) as well as the cheap railway fares, should attract a

considerable number of tourists. Particularly as regards railway fares there are the whole year round special reductions available, often as much as 70 per cent. on the tariff rates, and intending travellers to Italy are advised to consult any of the big tourist offices when booking their tickets for Italy beforehand. The ENIT (Italian State Organisation for Tourism) is publishing, jointly with the State Railways, a monthly travel magazine in English which gives a detailed list of all railway reductions available. This publication, which is well got up and illustrated, contains valuable general information for tourists travelling to Italy. The State Railways have published a programme of the Sunday excursion trains which begin on June 3 and continue until September 30. A large number of new trains will be run as compared with preceding years.

SOUTH AFRICA

An Optimistic Budget

Mr. O. Pirow, Minister of Railways and Harbours, in presenting his railway budget in the House of Assembly on April 11, announced that there was a surplus of £1,110,000 for the financial year ended March 31, 1934. It was a budget radiating a keen spirit of optimism and suggesting developments of a far-reaching nature in the future. "During the next year," Mr. Pirow said, "the administration will be in a position to formulate a policy beyond the hand-to-mouth measures necessitated by the depression." For the year ending March 31, 1935, he is anticipating a total revenue of £27,759,590 and an expenditure of £27,498,637, giving a surplus of £260,953, and if this surplus is realised the normal accumulated deficit of the railways and harbours will stand at that date at slightly over two millions.

In outlining some of his plans for a "permanent post-depression policy," the Minister stated that this involves reconsideration of the capital, loan and interest position and of services rendered free of charge and possibly the granting of relief in respect of rates and fares. He considered with regard to his rates policy that while certain branches of agriculture have claims to cheaper rates, relief is mainly due to industrial and commercial concerns, and was of opinion that with returning prosperity the railways should play an important rôle in the stimulation of industrial development as well as in the maintenance of the cost of living at a reasonable level. Mr. Pirow has in view the establishment of a Rates Advisory Appeal Board on which commerce, industry and agriculture will have representation.

Turning to the Harbours administration, Mr. Pirow announced the appointment of an Oversea Commission to investigate the Union's harbour position. Investigations will commence in Cape Town in August and the Commission will deal particularly with the question of the layout of the new basin, developments in this connection involving expenditure of nearly one million pounds. In connection with airways expansion, the Minister foreshadowed some remarkable developments. New services are under consideration and the convenience of passengers will be studied by the co-ordination of rail and air services as far as possible.

Referring to the question of further electrification, the Minister announced that investigation would take place in the course of the year by departmental experts in connection with the ultimate possibilities of electrification in the Union. The rule, he said, usually accepted in Europe in connection with electrification is also applicable to South Africa, namely, that it should be confined to heavy traffic over steep gradients and to fast traffic requiring frequent stops and quick starting. The first requisites are present chiefly in Natal, the second principally in the industrial area of the Witwatersrand and its extensions to Witbank and possibly beyond.

A White Paper tabled by the Minister setting out the results of working during 1933-34, showed that it is now expected that the year 1933-34 will result in a surplus of £1,410,379 made up as follows:—

	£
Railways	1,380,775
Harbours	32,210
Steamships	3,150
	£1,416,135
Less deficit under airways ...	5,756
Net surplus	£1,410,379

Included in this surplus is an amount of £300,000 representing profit realised on the sale and conversion of the administration's investments, so that the actual surplus expected for the year 1933-34 will be £1,110,379.

The total staff of the department at the end of March, 1934, was 81,175. An outstanding feature of the past year's working was the number of livestock railed, namely, 7,931,000 head, representing an increase of 4,301,000, or 118 per cent., over the previous year's number. The results of the working of road motor services for the year show a surplus of some £35,500.

THE FAR EAST

New Lines in Manchuria

Three new railways are to be constructed in Manchuria to the order of the Manchukuo Government by the South Manchuria Railway. These are (1) From Tumen on the Korean border to Mutanking, crossing the Chinese Eastern line between Aiho and Hailin; (2) from Peianchen to Erhchan, in extension of the Tsitsihar line and eventually going on to Heiho; and (3) from Koupeiyington to Lingouan, an extension of the Chinchow-Peipiao railway. *Eastern Engineering & Commerce* understands that these constructions have already been started.

FRANCE

Returns for Last Year

Preliminary French railway returns for 1933 show a total deficit for the seven principal systems of nearly 4,000 million francs (£50,000,000). This deficit, however, is not merely the difference between expenditures and receipts. It also includes capital charges and interest on loans. The following figures are in millions of francs:—

System	Receipts	Expenditures	Deficits
Alsace-Lorraine	793·7	882·7	275·9
Est.. ...	1,597·6	1,582·9	418·0
State ..	1,761·2	2,137·7	934·9
Midi ...	735·4	791·4	400·5
Nord ..	1,824·9	1,832·8	608·7
Orleans ...	1,664·3	1,528·7	346·8
P.L.M. ..	3,186·4	3,260·9	992·9
	11,563·5	12,017·1	3,977·7

Deficits accumulated in the four years 1930 to 1933 amount to 11,580 million francs. To this amount must be added accumulated interest charges on deficits incurred in the years 1921 to 1925, amounting to 1,846 millions. The total deficit of the French railway common fund on April 30, 1934, is thus brought up to 13,426 millions (£167,575,000).

GERMANY

Railway Construction in the Ruhr

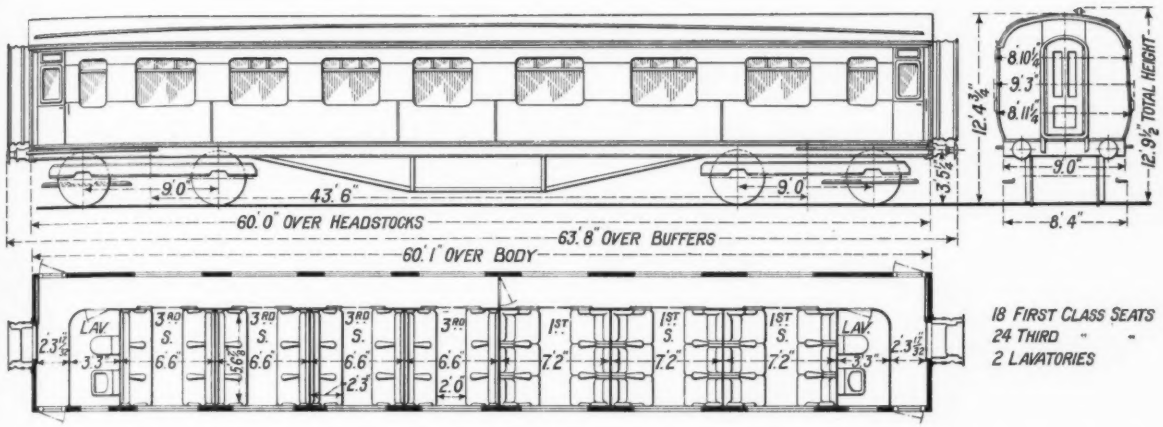
The plan for improving railway services within the Rhein-Ruhr area goes back as far as 1927. In that year the widening of the double line between Cologne, Duisburg, Essen and Dortmund was first mooted. The general scheme also embraces an extensive programme of additional new lines, which—though individually of no considerable length—will collectively and in conjunction with the existing lines ensure much better working facilities than to-day. One of the important links under construction is the line connecting Bochum with Gelsenkirchen, thus providing a new direct route from Bochum to Duisburg, additional to the one via Essen already existing. Work upon the southern extension from Cologne to Duisburg is, however, at present more advanced.

In conjunction with the widening works, alternative plans had to be prepared either for building new stations or for rebuilding those existing. The more important places concerned are Düsseldorf, Duisburg, Essen, Gelsenkirchen, Bochum, and Dortmund. At Düsseldorf and Duisburg work is in progress, the latter station being nearly finished.

The measures mentioned so far are all devoted to the benefit and betterment of the traffic flowing west to east and *vice versa*. Moreover, the administration has decided to improve the north and south communications and services also and plans are to be prepared for two new lines in this direction, one leading from Bochum via Wanne to Recklinghausen, the other from Essen via Marl to Haltern.

MODERN BRITISH RAILWAY CARRIAGE CONSTRUCTION

An example of up-to-date main line British passenger stock is provided by some new composite corridor coaches for the L.M.S.R.



IN an editorial article on page 779 we refer to the controversy about the relative merits of all-steel and semi-steel rolling stock construction. The main line railways of this country adhere generally to the practice of building for passenger service eight-wheeled bogie carriages with riveted steel underframes having timber framed bodies mounted on them. The external panelling of the bodies is usually of sheet steel, and the ends of the carriages are strengthened to minimise the risk of damage in collision.

As an example of the latest type of standard construction, a recently built composite corridor coach of the London Midland & Scottish Railway is described and illustrated herewith, by the courtesy of Mr. W. A. Stanier, Chief Mechanical Engineer of that company.

The batch of 70 vehicles from which our example is taken adheres generally to the standards of those built during the last few years by the L.M.S.R. and incorporates the latest refinements of comfort. The arrangement of the doors, windows, and seating, as well as the principal dimensions, are shown on the accompanying drawings, which also illustrate the main constructional details.

The underframe is constructed of rolled steel sections, the solebars, bolsters, longitudinals and headstocks being channels, whilst the truss frames are built up of angle sections. The bogies are of the four-wheeled single bolster type, with helical concentric bolster and side laminated bearing springs. The bottom centre and side bearing castings are fitted with lubricating pads carried on light spring frames, the latter fitting into oil channels in the castings, from which the oil is drawn to the pads by means of wicks attached to them. Connections between the carriages are made by standard L.M.S. overslung gangways and the vehicles are fitted with the vacuum automatic brake in conjunction with which two 18 in. cylinders are used.

Body Details

The body framing is of teak, and the sides, ends and roof are steel panelled. The exterior is designed to give a flush finish, the glass being bedded up to the exterior steel panelling. The pillars are secured to the cantrails and bottom sides by pressed steel knees bolted to the respective members. The bottom sides, body side pillars and rails, cantrails and roof sticks are either bored or grooved to allow of an air circulation between the body and roof steel panelling and inside linings, thus minimising the risk of condensation and its effects. The roof panels are made of No. 16 S.W.G. galvanised steel purchased to a standard size and cut to suit in the company's workshops. The body side and end panels are of No. 16 S.W.G. steel having a superior charcoal finish. The panels are secured to the body and roof framing members by sherardised wood screws, the holes for which are countersunk punched. Grooves to accommodate the projections of the punched holes are milled in the framing members where required.

In the upper portion of each compartment and corridor window a sliding extractor ventilator is fitted, so designed as to preserve the flush appearance given by the fixed window below. This ventilator light is of an improved type compared with those originally fitted by the L.M.S. Company, the size of opening being considerably greater, both in regard to depth and width. The sliding portion of the ventilator consists of two lights opening in opposite directions into pockets in the body side framing.

To minimise track and running noises the body is well insulated from the underframe by rubber body pads. In addition the floor is made up of cork sheeting on galvanised dovetailed steel sheets. The cork is supplied in sheets measuring 3 ft. by 2 ft. with corrugations to fit those of the steel plates. It is secured thereto by a bituminous solution and afterwards levelled down by a special levelling tool.

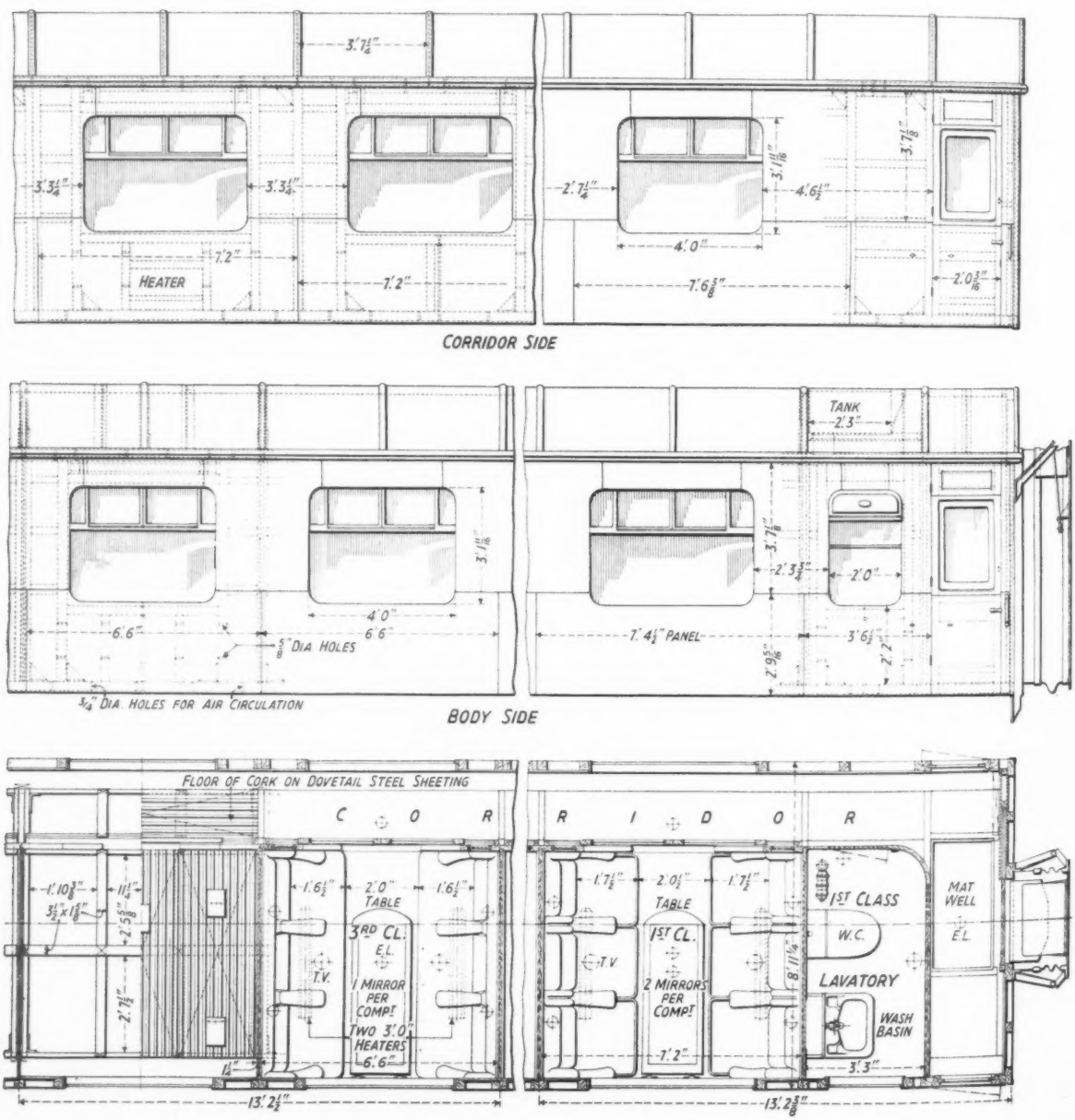
Interior Finish

Great care and skill have been expended in connection with the interior finish. The first class compartments are panelled in walnut. They are upholstered in light blue moquette and the floor has a covering of linoleum laid on felt, surmounted by a handsome hand loom carpet. A frameless bevelled mirror is fitted over each seat and Bakelite ashtrays and bell pushes are provided. The metal work is finished nickel silver. On the seats are loose cushions supported on spring frames and the backs are also built up on deeply sprung frames. Head rests and folding arm rests are provided and in each compartment is a hassock. Blinds of blue and gold shell pattern are

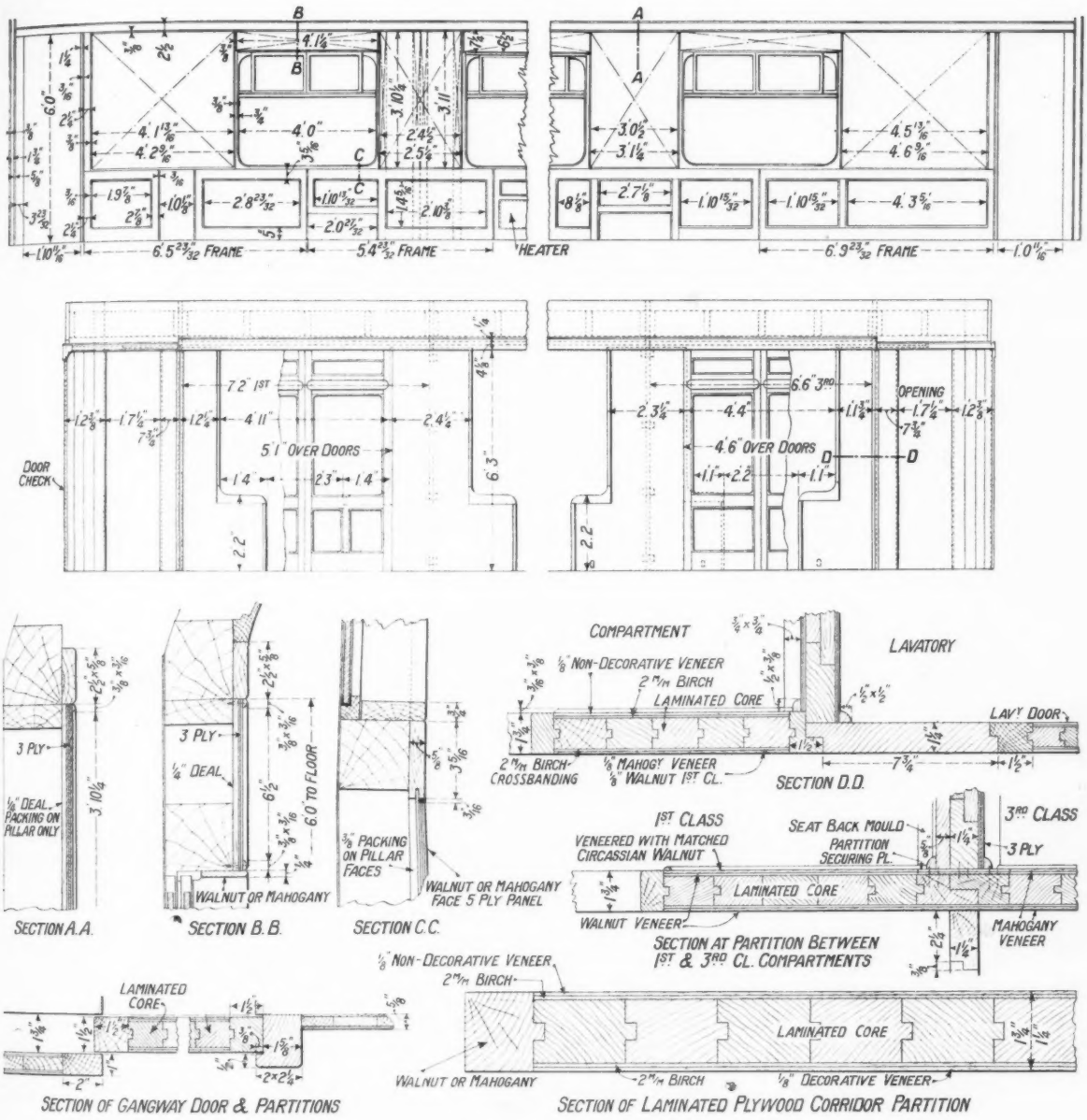
housed within the body framing in both the first and third class compartments.

The third class compartments are finished in mahogany framing with brown grain panels of three-ply above the seat. The upholstery is of brown rep and the floor has a covering of brown linoleum laid on felt. Each compartment has a mirror, two large photographs showing places of interest on the L.M.S.R., and an advertisement panel. Bakelite ashtrays and bell pushes are also fitted and in this case the metal work finish is oxidised Venetian bronze. The seats are built up on spring frames, and arranged to seat three aside. Arm rests made to fold flush into the seat back add to comfort, and indeed, this accommodation provides the highest standard of comfort and convenience for third class travel.

Access from each compartment to the corridor is by double sliding doors, so arranged in conjunction with the corridor partition as to give passengers sitting on the corridor side a window outlook equal to that on the body side. The sliding doors are fitted with blinds housed to give a flush finish on the compartment side. The corridor partition is made up of laminated wood-core section $1\frac{3}{4}$ in. thick and finished on the corridor side with a decorative veneer. The sections, of which an illustration is given, have a lipping of solid wood up to which the outer veneers butt to form a flush finish. Gangway sliding and lavatory folding doors of laminated wood are also used and the lobby ends are finished in the same style, the whole presenting a very handsome effect. The junction of the corridor and lobby partitions is well radiused to facilitate passage through the car. The corridor body side is finished with 5-ply veneer faced panels



Third class, first class, and lavatory outside elevations, sectional plan, and plans



Interior elevation of side walls and corridor partitions and typical sections

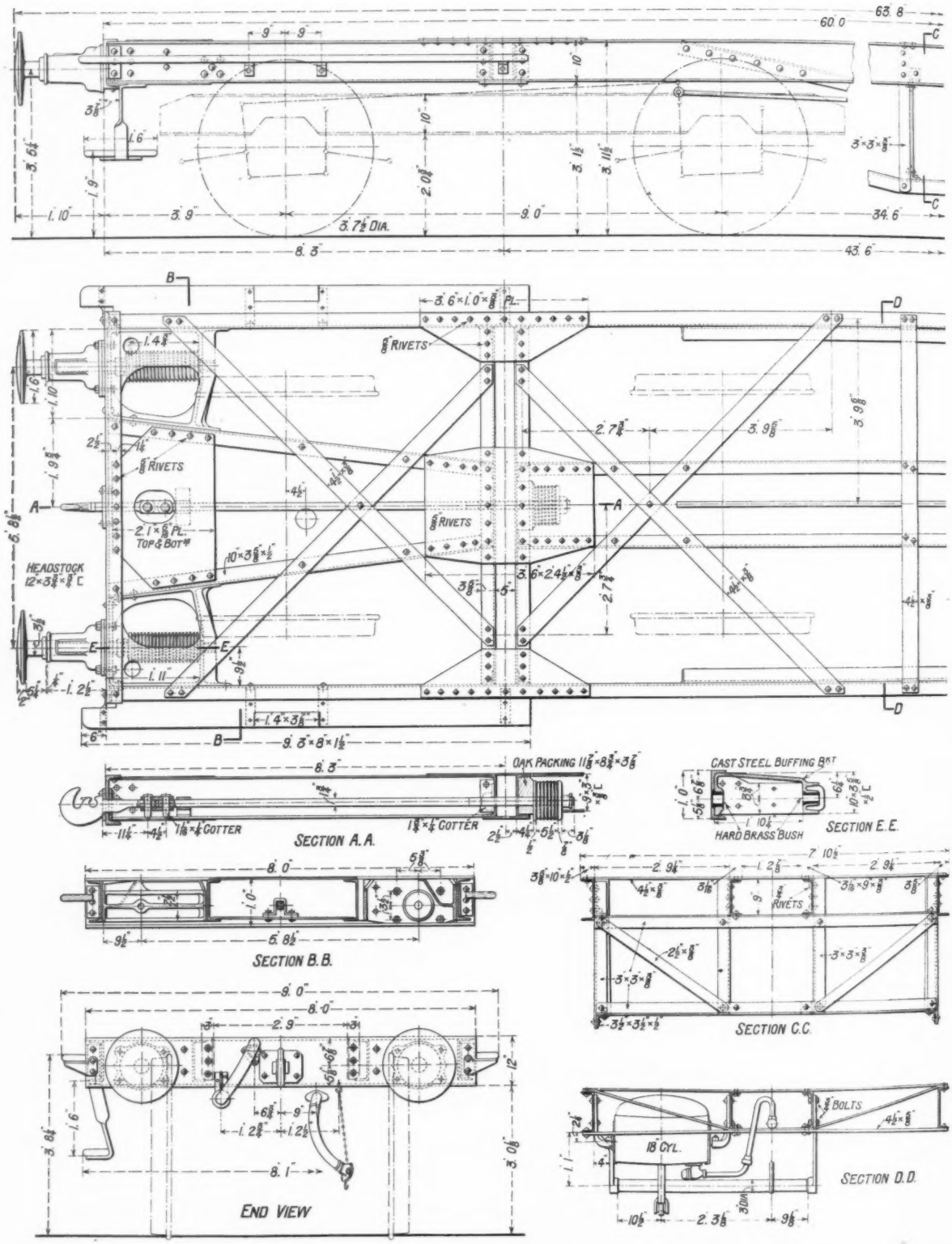
below the waist and three-ply panels stained to match the finish above, the whole presenting practically a flush appearance.

The first and third class portions of the corridors are finished in walnut and mahogany respectively, and are divided by a swing door. The corridor floor is covered with linoleum on felt and, in addition, the first class portion has a Wilton carpet.

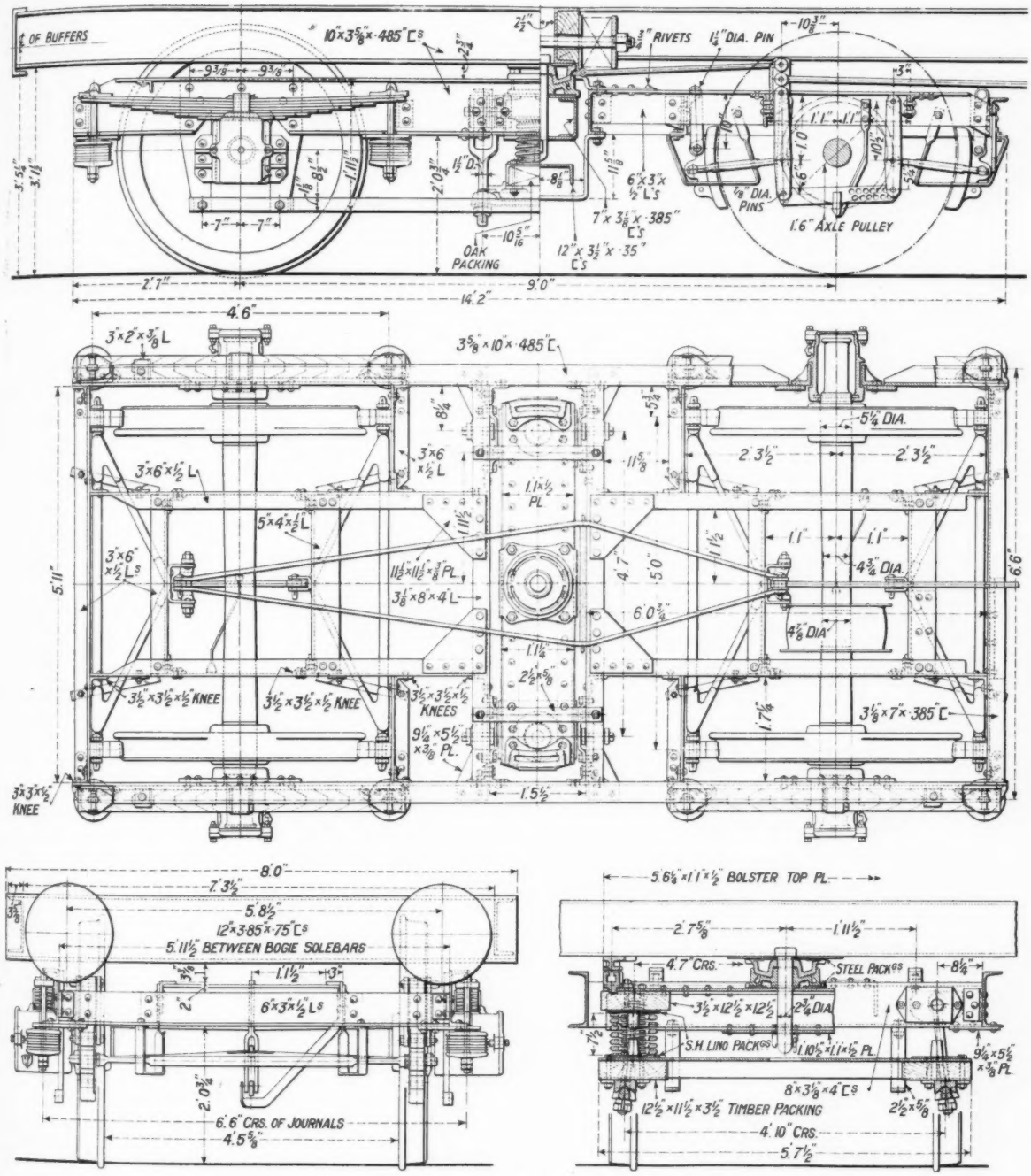
The walls of the lavatories are finished in duck-egg-shell blue, relieved with mouldings of walnut or mahogany, and the floors are covered with Terrazzo with a green coved border to tone with the walls. Hot and cold water is supplied to an earthenware wash basin from a Westinghouse water heater fitted behind the mirror cabinet above the wash basin, and additional fittings include a radiator, toilet shelf, towel rack, hat and coat hook and the usual toilet fitments. The water tank is in the roof and cased on the underside to form a flat ceiling. The tank filling funnels have pipe connections running along the roof and down the end of the car to enable the tanks to be filled from the platform or permanent way. The end pipes also serve the purpose of roof ascending handles, a novel feature. All compartment, corridor and lavatory ceilings are of 3-ply birch enamelled white.

Lighting, Heating and Ventilation

The electric lighting system in these coaches is that known as the L.M.S. train lighting system, with which all L.M.S. coaches are now fitted. The equipment consists of a variable speed dynamo, a single battery of 12 lead-acid cells having a capacity of 250 ampere-hours, and a regulator. The latter controls the output of the dynamo, governs the lamp voltage and regulates the charge to the battery in accordance with requirements. This regulator



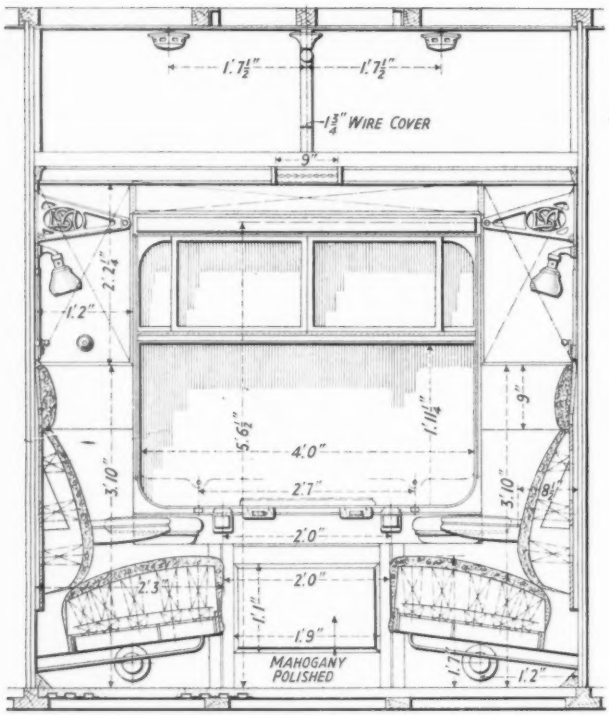
Details of underframe, showing buffing and draw gear



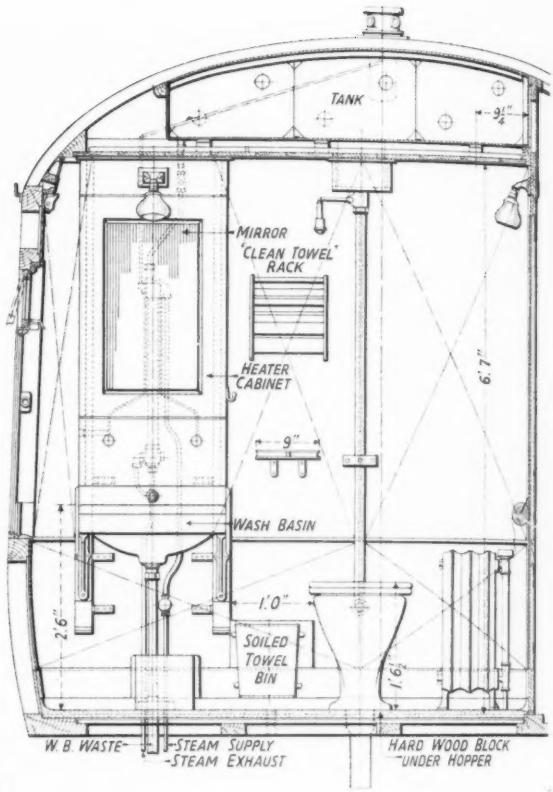
Details of bogie

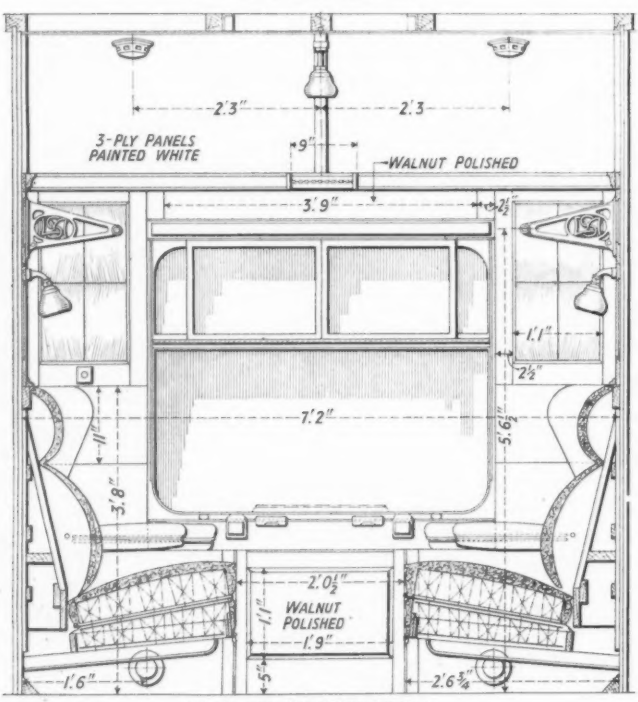
embodies also a dynamo cut-in switch and a magnetic lights switch. The magnetic switch is operated by sub-controllers, one in the vestibule and the other accessible from the exterior of the coach and fixed on the coach end. It also functions in response to the main controller fitted in all brake compartments, being connected thereto by the "through control" circuit to Railway Clearing House standard, with which all new stock is furnished. The battery box is supported from one of the main truss bars and is so arranged that the cells can be handled from the side of the coach free of obstructions.

As well as a single roof light mounted in a porcelain reflector, each third class compartment has four bracket lamps fixed to the squab frame over the back of the seats. In the first class compartments, which also have lamps over the seats, the ceiling fitting is a twin-light. Except the third class ceiling light, all compartment lamps have opal glass shades. The first class compartment lamp brackets are of metal with switch lampholders, and in the third class the brackets consist of moulded Bakelite with moulded switch lampholder. Lighting of the corridor and vestibules is effected by porcelain ceiling

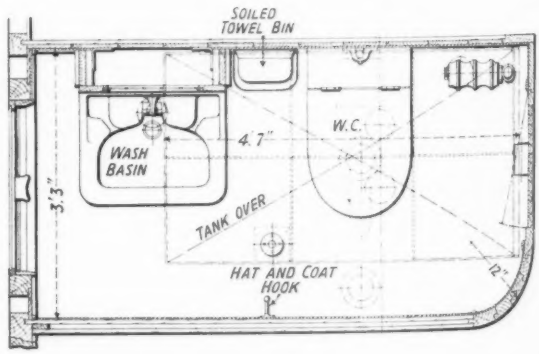


3RD CLASS COMPARTMENT





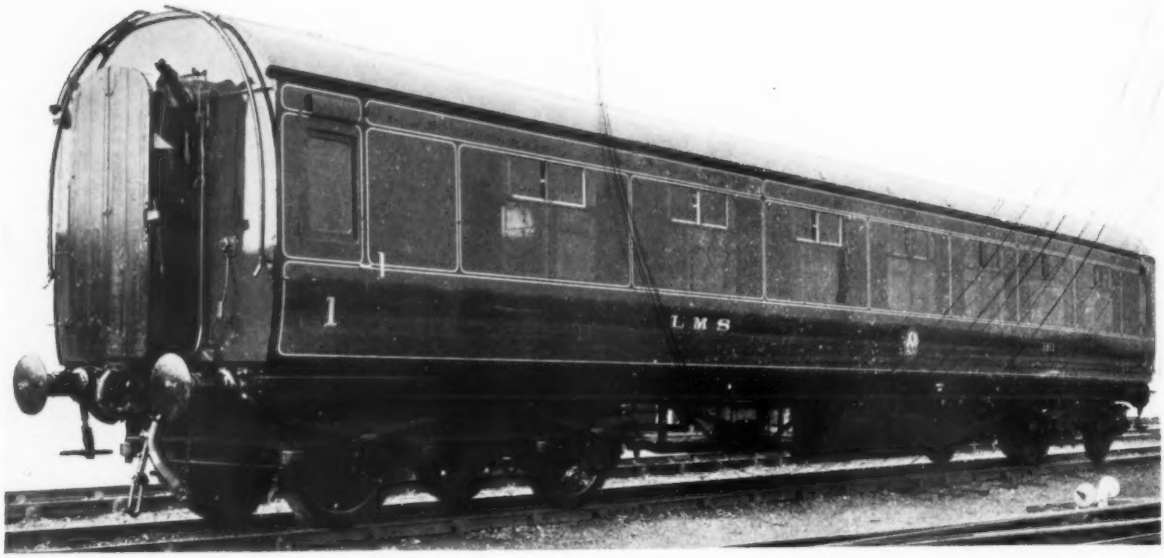
1ST CLASS COMPARTMENT



Sections of third and first class compartments (left) and section and plan of lavatory compartment

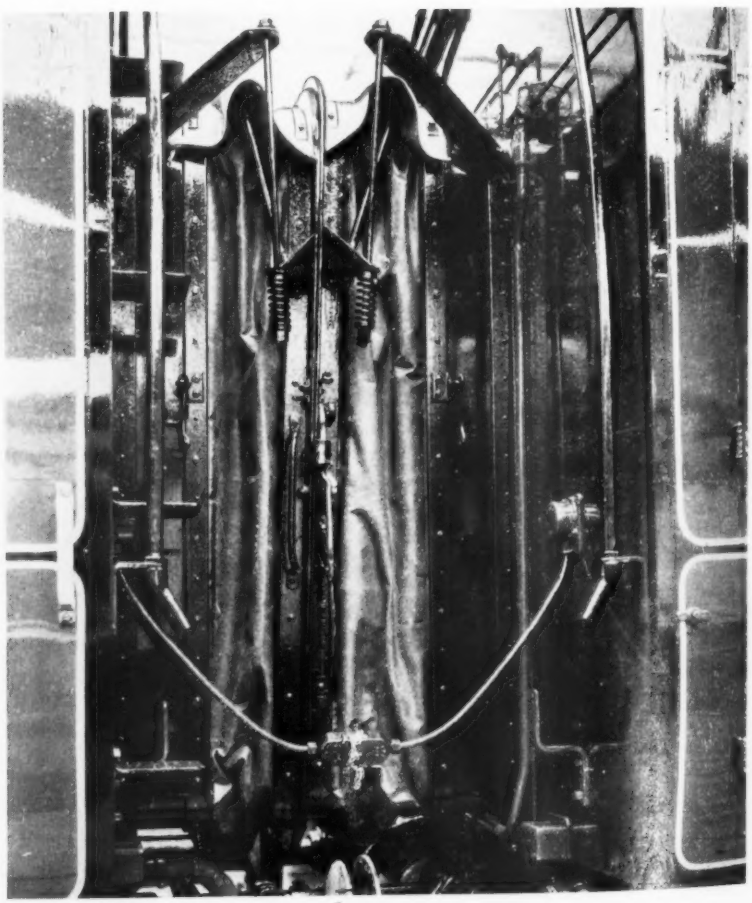
Left: Interior of first class compartment, body side

Right: Interior of third class compartment, corridor side



Exterior view, showing the flush finish of the L.M.S.R. stock

The corridor of one of the new coaches



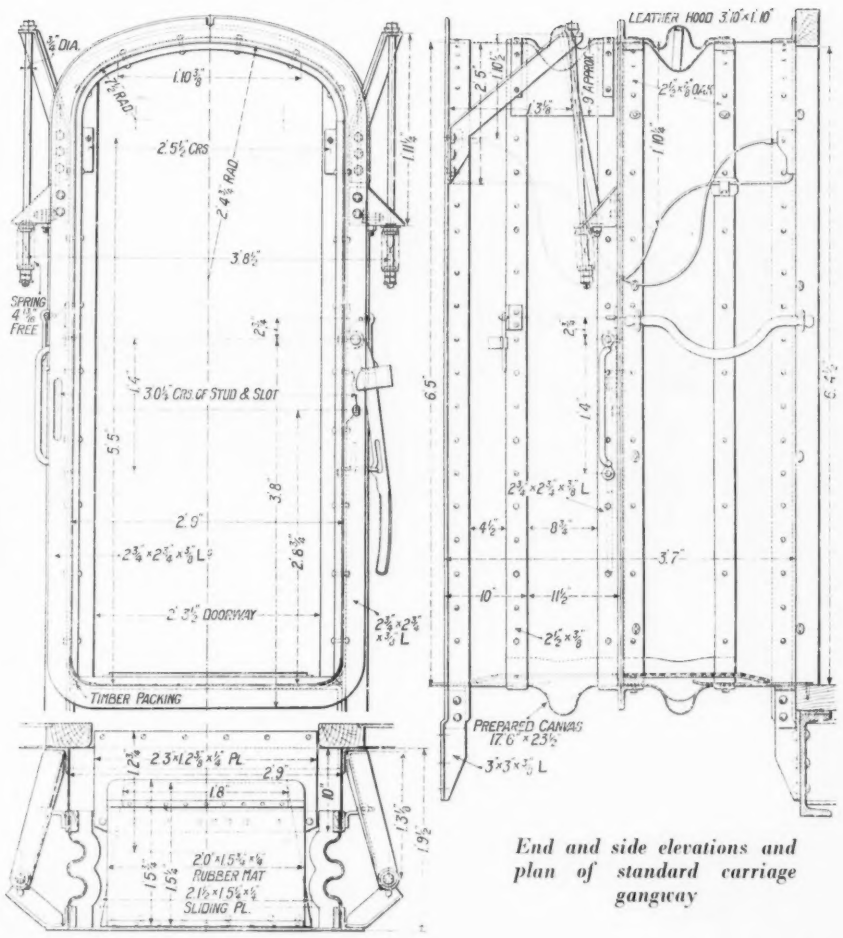
Standard gangway connection

reflectors. The lavatories each have two lamp brackets of the same design as those in the compartments. All the lamps are 14 watts pearl. In accordance with standard practice on this class of stock, through bell communication is provided between each compartment and the dining car of the train. An indicator over the door of each compartment shows from which point the call has originated.

Each compartment is fitted with two 3-ft. Westinghouse steam heaters with separate positive cut-off valves and operated by Bowden-wire-controlled regulators fitted over the seats. Two concealed heaters are fitted in the corridor and a column radiator in each lavatory. Besides the ventilation obtainable by means of the sliding lights over the fixed part of the windows, roof ventilation is also provided by Ashanco air extractors.

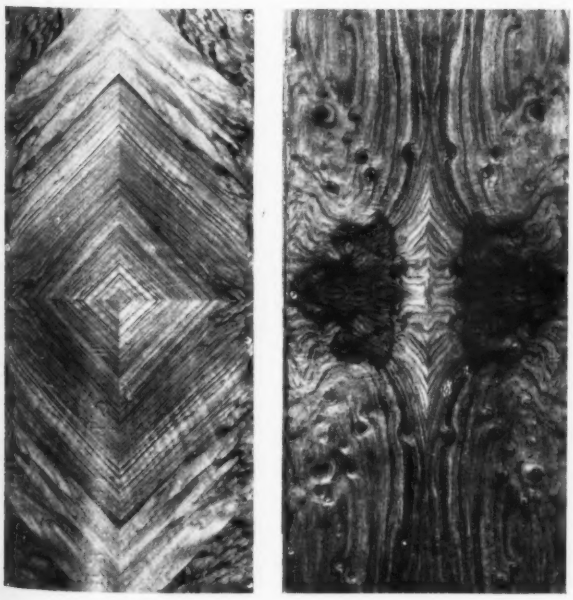
The vehicles have the following leading dimensions:—

Length over body	60 ft. 1 in.
Width over body at waist	8 ft. 11¼ in.
Length of underframe	60 ft. 0 in.
Length over buffers	63 ft. 8 in.
Centre of bogies	43 ft. 6 in.
Bogie wheelbase	9 ft. 0 in.
Axle journal	9 in. by 4 in.
First class seats	18
Third class seats	24
Tare weight	32 tons.



End and side elevations and plan of standard carriage gangway

Among the manufacturers of materials and components whose products have been used in these coaches are those given in the opposite column.



Typical specimens of wood panelling

Upholstery—	
1st class compartments	J. Holdsworth & Sons Ltd., Halifax.
3rd ,, ,,	John A. Wood & Sons, Manchester, and T. F. Firth & Sons Ltd., Heckmondwike.
1st class compartment carpet	Carpet Trades Limited, Kidderminster.
1st class corridor carpet	T. Firth & Sons Ltd.
Sliding ventilator lights	J. Beresford & Son Ltd., Birmingham, and A. G. Wild & Co. Ltd., Sheffield.
Steel body panels	J. Lysaght Limited, Newport, Mon., Smith & McLean Limited, Glasgow, and Baldwins Limited.
Cork flooring	J. W. Roberts Limited, Armley.
Laminated wood for corridor partition and side wall finish	Aeronautical & Panel Plywood Co. Ltd., London, Flexo Plywood Industries Limited, Chingford, Laminated Wood Products Limited, East Cowes, and Tucker Armoured Plywood Co. Ltd., Crayford.
Seat and seat back spring frames	Lace Web Spring Co. Ltd., Sandiacre, Nottingham.
Train lighting	J. Stone & Co. Ltd., and Vickers Train Lighting Co. Ltd.
Lamp brackets—	
1st class compartments	General Electric Co. Ltd.
3rd ,, ,, (moulded Bakelite).	A. H. Ashdown Limited, Birmingham.
Steam heating	Westinghouse Brake & Saxby Signal Co. Ltd.
Roofing ventilation	Thos. Ash & Co. Ltd., Birmingham.

Rexine finish is used at the ends of the coaches, lavatories, &c.

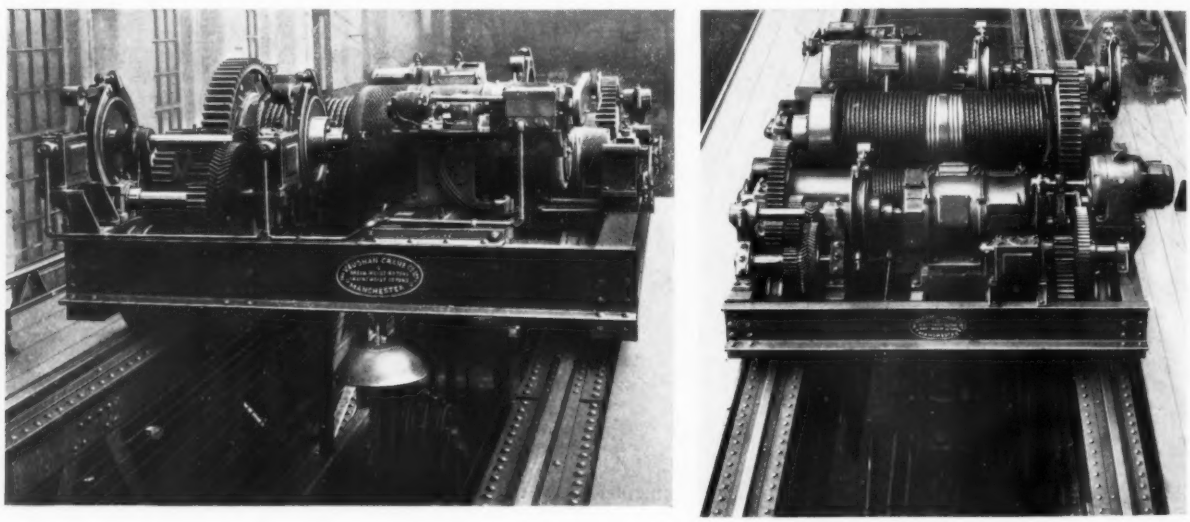
CRANE CONTROL AT INCHICORE

The Vaughan Patent a.c. variable speed control facilitates in a simple and reliable manner the operation of electric, overhead and other forms of cranes at low speeds

THE device of which particulars and illustrations are given herewith has been fitted to a number of cranes, including the 40-ton travelling cranes supplied by the Vaughan Crane Co. Ltd., Manchester, to the Great Southern Railways of Ireland, for use in the company's locomotive works at Inchicore.* It consists of the use of a commutator motor fitted with a pilot motor for operating the brush gear, and having in conjunction with it a drum contact limit switch, together with a reduction drive for the pilot machine. Variable speed control is obtained in the commutator motor by varying the position of the brushes on the face of the commutator, this commutator being connected to a secondary winding of low voltage, so that any sparking which takes place under onerous conditions is only of the pin-point type, and negligible compared with the fault usually known "as sparking on the commutator."

A simple industrial pattern drum controller of special construction is arranged to serve the dual purpose of controlling the main motor and the pilot motor at one operation. It has three notches, the first switching the main motor across the line and leaving the brush gear in the slow speed position. A movement of the controller from the first notch to the third notch sets the pilot motor in operation and the brushes begin to travel across the face of the commutator. By a return to No. 2 notch, any intermediate speed can be obtained, as on this notch the pilot motor is instantly stopped and the brushes remain in the position they have attained whilst on No. 3 notch. Similarly, in the reverse direction, the speed can be lowered by returning to No. 1 notch, and, if the ultimate dead-slow speed is not required, a return to No. 2 notch will give the desired intermediate speed. The Vaughan system provides solely for the electrical control of the brush gear operating mechanism, and no resistances whatever are employed.

The economy in current consumption on low speeds is very marked as compared with ordinary slip ring motors or d.c. machines, and from two-thirds of full load and two-thirds of full speed upwards practically unity power factor is obtained. It has a further advantage in that as the acceleration is outside the control of the operator, the controller can be put through to the third notch when full speed is required and the acceleration is automatic, and consequently foolproof. This system developed by the Vaughan Crane Co. Ltd. is one of which the want has been felt for very many years, and particularly in view of the fact that since the start of the change-over from direct to alternating current, which has been proceeding for some time, dead-slow speeds have only been obtainable by driving ordinary slip ring motors against a mechanical brake. This is extremely wasteful in current and quite uncertain in its operation, being entirely at the mercy of the operator.



Patent a.c. variable speed control device as fitted to Vaughan cranes

* The layout of the new locomotive erecting shop, replacing buildings of about 1850, was illustrated and described in our issue of November 24 last.

WILLIAM BEARDMORE & CO. LTD.—At the annual meeting of William Beardmore & Co. Ltd. on April 27, Mr. H. A. Reincke, Chairman and Managing Director, explained that expenditure on high-speed diesel engines, the manufacture of which was transferred to Dalmuir last year, was responsible for a considerable proportion of the debit to profit and loss account. This represented the measure of the endeavour made to keep the Beardmore engine in the front of diesel engines. Negotiations were in progress which would result in decisions of the greatest importance as to the future value of this asset. The Parkhead forge had earned a trading profit since September of last year.

ITALIAN REFRIGERATOR VANS FOR ENGLISH TRAFFIC

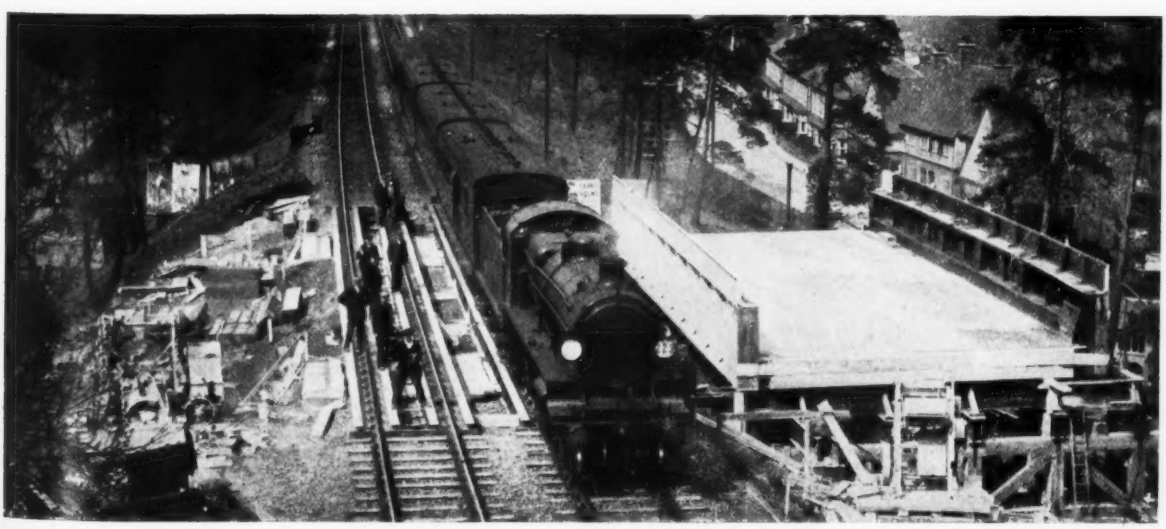
THE Società Italiana Ferryboats, of Milan, has hired from the Italian State Railways 1,300 special trucks for the conveyance of horticultural products from Italy to England, about half of them being of the refrigerator type. The trucks have been specially built by the State Railways to comply with the British requirements, and their cross-section is identical with that of the L.N.E.R. Continental type 24318 E.

The following are the principal characteristics of the refrigerator vans:—Length between buffers, 9,830 mm.; length between wheel centres, 4,500 mm.; useful internal length, 7,976 mm.; useful internal width, 2,182 mm.; useful internal height, 1,882 mm.

The vans are fitted with automatic brakes suitable for both English and Continental railways and with hand brakes. The body has a steel frame, and is sheeted internally with metal and externally with timber, the space between the two being filled with cork slabs protected by bituminous cemented pulp board. The flooring is of special construction, with double inclination towards the centre for drainage. On its surface is a removable grating which allows free circulation of the cooled air. At each end a galvanised iron cage holds 1½ tons of ice, the ice being loaded through four openings at the sides. Electric plugs control fans placed over the ice boxes for the purpose of pre-cooling the vans prior to transport. Wooden bars along the inside walls enable planks to be laid across so as to form suitable divisions for loading either different types of goods in bulk, or part in bulk and part in packages. The capacity of the van is 27 cu. cm. between the ice boxes and up to the springing of the roof. The roof is of steel and is protected from the sun's rays by an outer wooden canopy. It weighs 16·750 kg. empty and can carry 13 tons, including 3 tons of ice.

Refrigerator van for conveying horticultural products from Italy to England

The other type of truck has no ice boxes, but the sides are composed of double layers of timber and the roof has a wooden lining insulated by cork from the steel outside. For ventilation purposes 12 fixed louvres are provided at floor level and two open grid ventilators on each side below the roof. A wire net door is fitted in each van to be placed in the opening left by the sliding door when this is kept open for better ventilation. In other respects the constructional features of this vehicle are the same as in the other refrigerator van. The capacity of the ordinary vans is 15 tons or 37 cu. m.

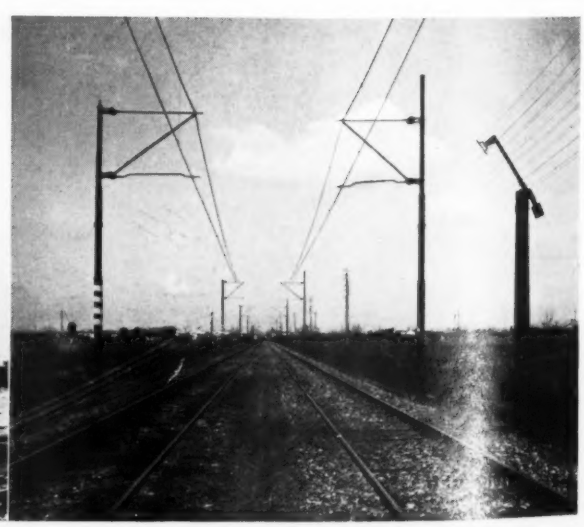


The new Guildford-Milford by-pass road is to pass under the Portsmouth Direct line of the Southern Railway, near Guildford. Above is seen the underline bridge assembled ready for rolling into position

Above: Prince George's Royal train on the Benguela Railway passing over the rack section on the descent to Lobito

Left: The first of the new L.M.S. 2-6-4, three-cylinder, taper boilered tank locomotives for fast suburban traffic, in service. These engines were described in our issue of March 30 last

Below: The Kofler train stop on the Nord Milan Railway. Electric locomotive fitted with the apparatus (left) and line-side standard (right). Note the painting of the poles on the left, indicating the approach to a signal. See also news paragraph on page 806



RAILWAY NEWS SECTION

PERSONAL

L.N.E.R. Deputy Chairman

At a meeting of the London & North Eastern Railway Board of Directors, held on April 27, Sir Murrough John Wilson, K.B.E., was appointed Deputy Chairman of the Company in place of the late Rt. Hon. Lord Faringdon, C.H.

We are glad to learn that the condition of Lord Ashfield, who underwent an eye operation at the Middlesex Hospital on April 29, is reported to be satisfactory, and that progress towards recovery is all that can be expected.

From the *London Gazette*:—Engineer and Railway Staff Corps.—Edward Henry d'Esterre Darby, M.Inst.C.E., to be Major (April 28). Major Darby is Divisional Engineer, Derby, L.M.S.R.

At a board meeting of the Central Argentine Railway yesterday (Thursday) Mr. Walter K. Whigham was elected Chairman and Mr. W. Howard-Williams Deputy Chairman of the Company.

Count Ciano, who has held the position of Minister of Communications in Italy for the past 10 years, has been elected President of the Chamber. Signor Puppini has been appointed Minister of Communications in his place.

We regret to record the death, on April 26, of Mr. A. G. Rotinoff, M.Inst.C.E., M.I. Struct. E., M. Soc. C.E. (France). Mr. Rotinoff was well known to railway engineers as the inventor of the ingenious West-Rotinoff system of piling.

The Council of the Institution of Civil Engineers has made the following awards for papers read at ordinary meetings during session 1933-34:—

A Trevithick Premium to Mr. R. W. Foxlee, M.Inst.C.E., and Mr. E. H. Greet, B.Sc., Assoc. M. Inst. C.E., jointly, for their paper on "Hammer-Blow Impact on the Main Girders of Railway Bridges." Mr. Foxlee is a Deputy Chief Engineer and Mr. Greet is an Engineering Assistant to the Crown Agents for the Colonies.

A Telford Premium to Mr. W. E. Gelson, B.Sc. (London), A.C.G.I., Assoc.M.Inst.C.E., for his paper on "Moving-Load Stresses in Short-span Railway Bridges." Mr. Gelson is Assistant Bridge Engineer, North Western Railway, India.

A Telford Premium to Mr. E. F. Law and Mr. Vernon Harbord, jointly, for their paper on "Steel Rails." Messrs. Law and Harbord are partners in the firm of Riley, Harbord and Law, the consulting metallurgists.

Lt.-Col. Sir Murrough John Wilson, K.B.E., who, as announced above, has been elected Deputy Chairman of the L.N.E.R., was born in 1875 and educated at Marlborough. From 1893 to 1902 he was employed in the Traffic Department of the old North Eastern Railway, of which he was later elected a Director, in 1912. He is also on the Boards of the Forth Bridge Railway Company (representing the L.N.E.R.) and of the Peruvian Corporation. During the war he served with the Yorkshire Regiment, 1914-18, and in the latter year was elected M.P. for the Richmond Division of Yorkshire, the seat he held until 1929. Created a K.B.E. in 1927, Sir Murrough is a J.P. for the North Riding of Yorkshire and Deputy Lieutenant of that County. He is also Chairman of the Navy, Army and Air Force Institute.

Photo. by [*Russell*

Sir Murrough John Wilson, K.B.E.

Elected Deputy Chairman, L.N.E.R.

Indian Railway Staff Changes

Mr. A. G. Dunn has been appointed to officiate as Deputy Carriage and Wagon Superintendent, Burma Railways, as from March 15.

Mr. E. R. Casement has been appointed to officiate as Divisional Superintendent, E.I.R., as from March 10.

Mr. S. D. Gupta has been appointed Chief Accounts Officer, and Mr. P. M. Rau has been appointed to officiate as Deputy Chief Accounts Officer, E.B.R., as from March 21.

Dr. R. J. Dyson, Chief Medical Officer, M. & S.M.R., has been granted nine months' leave as from April 9, and Dr. H. J. Moore has been appointed to act in his place.

Mr. S. S. Elliott, Deputy Chief Engineer, M. & S.M.R., has been appointed to officiate as Deputy Agent of that railway as from April 9.

Mr. R. G. Manson, Traffic Manager, A.B.R., has been granted leave for eight months as from April 3 Mr. R. S. Vipan, Deputy Traffic Manager, has been appointed to act as Traffic Manager and Mr. V. L. Thompson as Deputy Traffic Manager from the same date.

Mr. K. Sadler has been appointed by the Crown Agents for the Colonies to be Assistant Engineer, Nigerian Govt. Ry.

It is with regret that we note the death, on April 30, of Sir George Sutton, Bt., President of the W. T. Henley's Telegraph Works Company, Limited, at the age of 77.

Lt.-Col. E. P. Anderson, Inspecting Officer of Railways, Ministry of Transport, and previously Deputy Chief Engineer, N.W.R., India, left estate valued at £16,586 (£14,944 net).

We regret to record the death, on April 30, of Sir T. Harris Spencer, K.B.E., J.P., M.I.Mech.E., a Director of the Birmingham Railway Carriage & Wagon Co. Ltd. and Vice-President of the Federation of British Industries.

Mr. H. J. Ketcham, the L.N.E.R. General Agent for the United States and Canada, retired on March 31, after 41 years' service. A former official of the Pennsylvania and Lehigh Valley Railroads, Mr. Ketcham was appointed in 1892 as the American Agent of the Great Eastern Railway. As an American representing an English railway, his position was unique, and Mr. Ketcham was well known in railway, shipping and tourist circles on both

sides of the Atlantic. Mr. Dester, General Traffic Manager in the United States of Associated British Railways (L.N.E.R.-L.M.S.R.-S.R.), gave a farewell dinner in honour of Mr. and Mrs. Ketcham at the Traffic Club of New York on Wednesday, March 28.

Mr. H. J. Ketcham.

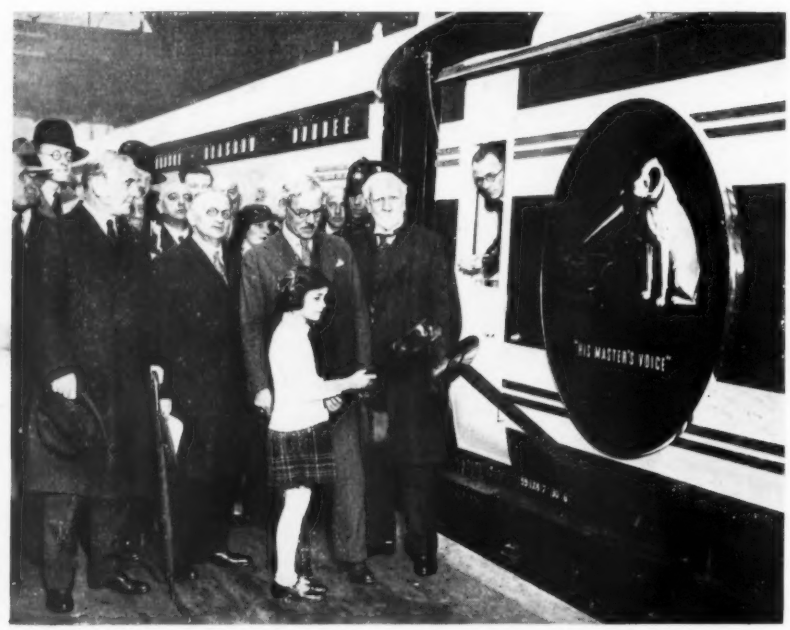
General Agent for the U.S.A. and Canada, L.N.E.R., 1892–1934

Mr. H. B. Everard, B.A. Cantab, A.M.Inst.C.E., who, as announced in THE RAILWAY GAZETTE of April 13, has been appointed District Engineer, Derby South District, L.M.S.R., was born in 1897 and educated at Marlborough and Cambridge: his entrance to the University was deferred owing to the outbreak of war in 1914. Joining the Rifle Brigade as 2nd Lieutenant, in 1915, he saw service in France, was promoted Captain in 1916 and was wounded on the Somme. During 1918 he was engaged at the Foreign Office under the late Lord Balfour and Lord Curzon of Kedleston and was sent to Egypt and Palestine in 1919, being demobilised on his return to England at the end of that year. He then entered Trinity College, Cambridge, taking an Engineering Degree and becoming a Bachelor of Arts. He played scrum half in Rugby football for his College and on occasions for the University also. Coming down from Cambridge in 1922, Mr. Everard joined the old Midland Railway as a cadet under Mr. James Briggs, Chief Engineer, and was posted to the New Works Department. In 1924 he was given the position of Resident Engineer on several new colliery branches, the largest being the Mid-Notts Joint line running through the Dukeries route of the new coalfield between Farnsfield and Ollerton. On completion of the latter construction in 1931, he was appointed Chief Assistant to the late Mr. F. H. Frere, District Engineer, Derby South District, L.M.S.R., and now succeeds him in that position under the Divisional Engineer, Mr. E. H. d'E. Darby. He is an Associate Member of the Institution of Civil Engineers.

Mr. H. B. Everard. B.A.,

Appointed District Engineer, Derby South District, L.M.S.R.

Radio Show Train.—Foremost among manufacturing companies to complete arrangements with the four amalgamated railway companies for a travelling show train is the Gramophone Co. Ltd., of Hayes, Middlesex. The train in this case comprises two 50-ft., eight-wheeled covered carriage trucks and an old dining car. These vehicles were entirely stripped of their interior fittings and then redecorated and fitted throughout by the Gramophone Company's staff. One coach has been tastefully decorated in cream, orange, and chromium for use as a showroom, and contains a wide range of wireless sets, radiograms, and gramophones. A concealed aerial has been fitted in the roof in order that the various sets may be demonstrated. The second carriage truck has been fitted with electric generating plant of sufficient capacity for lighting the train and operating the radio apparatus. The old dining car has been converted into a cafe, with kitchen adjoining, and also provides sleeping accommodation for three.



Inauguration of the "First Musical Train" at Paddington on Friday last

Front Row, left to right: Sir Robert Horne, Chairman, G.W.R.; Mr. Louis Sterling, Managing Director, the Gramophone Co. Ltd.; The Rt. Hon. Ramsay MacDonald, the Prime Minister; and Lord Marks, a Director of Electrical & Musical Industries Limited.

The exterior of the train presents a very striking appearance as the coaches have been painted in cream and orange with the well-known "H.M.V." trade mark of the dog and gramophone being shown at intervals. The train commenced on May 1 a tour which will last over three months, during which time it will travel nearly 3,000 miles and visit about 60 important towns throughout the country for the purpose of demonstrating to trade buyers the latest type of the apparatus manufactured by the company. The Prime Minister, accompanied by Lord Marks, inspected the train at Paddington on April 27. Mr. MacDonald was met at the station by Sir Robert Horne, M.P., Chairman of the Great Western Railway, and Mr. H. L. Wilkinson, Superintendent of the Line. With Mr. Louis Sterling, Managing Director of the Gramophone Co. Ltd., he inspected the train.

Railway Catering

A gratifying feature of the Railway Companies' Accounts for 1933 was the improvement in the financial result of the working of railway hotels, refreshment rooms and restaurant cars. Comparative figures for 1932 and 1933 are set out below:—

Company	Receipts		Expenditure		Surplus		Per cent. of surplus to gross receipts	
	1932	1933	1932	1933	1932	1933	1932	1933
	£	£	£	£	£	£		
G.W.R. ...	645,894	637,826	589,036	560,963	56,858	76,863	8·8	12·1
L.N.E.R. ...	1,665,281	1,667,924	1,600,932	1,582,244	64,349	85,680	3·8	5·1
L.M.S.R. ...	2,566,196	2,636,945	2,287,536	2,350,237	278,660	286,708	10·9	10·9
S.R.	101,137	104,263	105,902	104,851	Dr. 4,765	Dr. 588	—	—

It will be seen that in each case the 1933 result compares very favourably with that of 1932, particularly in the case of the G.W.R., which reduced its expenditure by £28,073, with the result that, despite a fall of £8,068 in receipts, the surplus showed an increase of £20,005 or 35 per cent. compared with 1932. The L.N.E.R. recorded a slight increase in receipts while effecting a saving of over £18,000 in expenditure, with the result that the surplus increased by £21,331 or 33 per cent. Despite this improvement, the percentage of surplus to gross receipts amounted to only 5·1 per cent. compared with 12·1 per cent. in the case of the G.W.R. The L.M.S. increased its receipts by £70,749, and thus maintained its surplus at the satisfactory figure of nearly 11 per cent. of the gross receipts. The Southern also recorded an increase in receipts, while at the same time effecting a slight saving in expenditure with the result that the net loss decreased from £4,765 in 1932 to £588 last year. It has to be borne in mind that the Southern figures relate to hotels only, the company's refreshment rooms and restaurant cars being in the hands of contractors.

A material factor in the improved results obtained by the G.W., L.N.E. and Southern Railways was the saving effected in the expenditure on provisions, wines and spirits, the economy under this head in the case of the Great Western amounting to as much as six per cent. This is no doubt due partly to the fall in the price of foodstuffs, but the good results achieved seem to demand some further explanation, and it would not appear unreasonable to suppose that the responsible officials have been paying particular attention to the more effective control of the element of waste which is always an important factor in public catering of any kind.

Hotels

The four group companies claim to own and control the largest group of hotels in the world, the figures for the individual companies being as follow:—

G.W.R.	7
L.N.E.R.	30
L.M.S.R.	33*
S.R.	9

* Including one owned jointly with the L.N.E.R.

A great number of these establishments are situated in commercial centres and have consequently suffered a considerable decline in revenue as a result of the depression in trade during the last few years. On the other hand, the business at the companies' "holiday" hotels has been well maintained. The G.W.R. has found that the accommodation at the well-known Tregenna Castle Hotel at St. Ives in Cornwall is insufficient for the holiday season and a number of additional bedrooms are now being provided. Similarly, the L.M.S.R. has found it necessary to add an extra wing to their Welcombe Hotel at Stratford-on-Avon, and a new Midland Hotel has been provided on the site of the old hotel at Morecambe. A large number of improvements and extensions has also been made by the railways in connection with their commercial hotels. The L.M.S.R. has remodelled and reconditioned the North Stafford Hotel at Stoke-on-Trent; the Exchange Hotel at Liverpool has been modernised by the installation of running hot and cold water and central heating in all the rooms; and similar work is in progress at several other of the company's hotels. The L.N.E.R. has completed the modernisation of many of their hotels and are engaged in the reconstruction of the Royal Station Hotel at Hull. The G.W.R. is proceeding with the modernisation of the Great Western Royal Hotel, Paddington, and has recently opened a cocktail bar and an extensive tea lounge, which is considered to be one of the most up to date in London.

Refreshment Rooms and Restaurant Cars

Similar improvements are taking place in the refreshment room accommodation provided at stations, the numerous reconstruction schemes of the last two or three years having enabled a great improvement to be made in the provision of refreshment facilities. A good example of the attention which is now being given to refreshment room accommodation may be seen at Paddington, where the G.W.R. has opened new and up-to-date refreshment and grill rooms on the arrival side. The grill room strikes a new note in appointments and furnishings, and a new buffet, also constructed on most modern lines, is proving very popular.

The four group companies operate a fleet of over 600 restaurant cars on which approximately 7,500,000 meals are served annually. So popular has the restaurant car become that practically every long distance train, including day and half-day excursions, is equipped with refreshment facilities. There is no doubt that the possibility of obtaining a table d'hôte luncheon or dinner *en route* is a very great attraction to many people, and, for this reason, the restaurant car must be regarded as an extremely valuable addition to the general amenities of rail travel. An interesting development of recent years has been the introduction of buffet cars for the service of light refreshments on secondary and excursion trains where the provision of a restaurant car is not justified. These light refreshment cars are becoming increasingly popular and it is obvious that they will hold an important place in the future of railway catering.

Forthcoming Events

May 4 (*Fri.*).—Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. Informal Meeting.
Past and Present Crewe Pupils and Premiums, at Trocadero Restaurant, Shaftesbury Avenue, London, W.1, 7.30 for 8 p.m. Annual Dinner.

May 5 (*Sat.*).—Locomotivemen's Craft Guild (London), at Borough Polytechnic Inst., S.E.1, 6.30 p.m. Annual General Meeting.
Stephenson Locomotive Society (Midlands). Visit to Derby Works and Running Sheds, L.M.S.R.
Institution of Locomotive Engineers (London). Visit to National Physical Laboratory, Teddington.
Wimbledon and District Model Railway Club. Visit to Nine Elms Locomotive Depot.

May 9 (*Wed.*).—Institute of Metals. Annual May Lecture.
Institution of Railway Signal Engineers, at Inst. of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. "The Rule Book and its Relation to Signalling," by Messrs. A. G. Rickett and B. Wagenrieder.
Stephenson Locomotive Society. Visit to Old Oak Common Running Sheds, G.W.R.

May 10 (*Thurs.*).—Institution of Electrical Engineers (London), Savoy Place, W.C.2, 6 p.m. Annual General Meeting (Corporate Members and Associates only).

May 12 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at Birkenhead, 3 p.m. Visit of Vice-President. "Railway Curves and the Quest for Speed," by Mr. W. Hepworth.

May 14 (*Mon.*).—L.M.S.R. (London) Amateur Dramatic Society, at Cripplegate Inst., Golden Lane, E.C.1, 8 p.m. "London Wall."
Permanent Way Institution (London), in Staff Dining Room, Waterloo Station (S.R.), 7 p.m. "The Re-alignment and Re-grading of Track in Tunnels," by Mr. L. G. B. Rock.

Forthcoming Meetings

May 25 (*Fri.*).—Société Nationale des Chemins de fer Belges (Ordinary General) Palais des Académies, Rue Ducale 1, Brussels, at 3 p.m.

Valuation of the Southern Railway

The Railway Assessment Authority (constituted under the Railways (Valuation for Rating) Act, 1930) has completed, and circulated to the railway company and the local authorities concerned, the first railway valuation roll relating to the Southern Railway. In August of last year the authority published the draft of this roll, and the completed roll now published contains the final determinations of the authority after hearing and considering the various representations made by the railway company and the local authorities with respect to the draft roll.

The total average net receipts for 1928 and 1929, by reference to which the total net annual value of the undertaking (the "cumulo") falls to be determined, are now fixed by the authority at £5,408,000, in comparison with £5,572,946 in the draft roll, the reduction being due to the deduction of interest upon certain sums of Government Compensation moneys which, by a recent decision of the House of Lords, have been held not to form part of the computation. The "cumulo" (which, subject to appeal, will govern the company's total liability for rates) is now fixed at £2,180,000, in comparison with £2,250,000 in the draft roll. The individual assessments previously contained in the draft roll have been revised to give effect to the reduction in the "cumulo," to the authority's decisions upon various representations received in regard to those assessments, and to the correction of various arithmetical and clerical errors.

Below is set forth a summary of the amounts of the "cumulo" of £2,180,000 which have been allocated to the county boroughs in total and to each administrative county on the system:—.

	£
County boroughs (11)	257,278
Counties (15):	
Berks	7,990
Buckingham	1,858
Cornwall	5,622
Devon	55,905
Dorset	35,475
Kent	362,978
London	608,428
Middlesex	43,212
Somerset	25,968
Southampton	207,486
Surrey	340,162
Sussex, East	121,124
Sussex, West	62,862
Wight, Isle of	13,923
Wilts	30,729

The largest individual assessment is that upon the Southampton docks, namely £100,000.

The completed roll will be on deposit at the offices of the Railway Assessment Authority, 32, Queen Anne's Gate, London, S.W.1., for two months from April 27 (the date of "completion"), and during that period it will be open to inspection (without any fee) by any persons interested during usual office hours. During the same period appeals, on questions of fact and law may be made to the Railway and Canal Commissioners (a) by the railway company in respect of any entry in the roll, (b) by the county valuation committees and county borough councils in respect of the average net receipts, the "cumulo," and the particulars relating to the individual hereditaments in their respective areas, (c) by the rating authorities concerned (other than the county borough councils) in respect of the particulars relating to the individual hereditaments in their areas, and (d) by "any person aggrieved" in respect of individual hereditaments. Thereafter, appeals will lie, on questions of law only, to the House of Lords. Finally, after appeals have been heard and determined, the roll will be "revised," and at that stage (and not before) the values appearing in the roll as revised will be transferred to the local valuation lists in substitution for the existing rating values, and the new values will take effect, for rating purposes, from April, 1931, any necessary adjustments in past rate payments being made between the company and the rating authorities. The total net annual value of the present rating assessments of the Southern Railway which will eventually be superseded by the values in the roll as "revised" is approximately £1,840,000.

The assessment Authority has yet to publish the rolls relating to the three other amalgamated companies (G.W.R., L.N.E.R. and L.M.S.R.) and the old Metropolitan Railway Company (now merged in the London Passenger Transport Board). The final values in all these rolls will, eventually, antedate, for rating purposes, to April, 1931.

The work of valuation has been proceeding since soon after the authority was set up in August, 1930, and it has involved the taking of particulars of land and structures at every station, works and depot and the estimation of train-mile receipts on every section of running line on the five systems concerned. The docks and canals of the companies are included in the valuation, but hotels, places of public refreshment, houses, and premises so let out as to be capable of separate assessment are excluded and are to be dealt with by the local rating authorities.

Reductions in German Passenger Fares

(*From our German correspondent*)

On May 1, the German State Railway Company introduced some remarkable reductions in passenger fares, including special concessions to large families, and in the shape of weekly tickets for employees, ten-journey tickets and special return tickets to and from East Prussia. Further measures such as reduction of minimum fares chargeable, reductions in platform tickets and in the luggage tariff will help to stimulate the recovery of the receipts already in progress. The reductions for families will be valid for those with at least four unmarried children under 18 years of age. They will be granted on condition that at least two members of the family—either the parents or two or more children or parents and children—travel together. The first person pays in full, each further person more than ten years of age or two further children between 4 and 10 years old pay half the fare. A third child up to 10 years old travels free. Supplements in express or semi-fast trains are also reduced by 50 per cent., a concession which is now offered in connection with all reduced fares, such as holiday tickets, week-end tickets, etc.

Employees' Weekly Tickets

Employees, whose income does not exceed 2,400 marks a year can travel on reduced weekly tickets from their homes to their work and *vice versa* at workmen's ticket rates. When travelling to and fro once a day, the reduction amounts to 62·78 per cent. of the ordinary fare. Unlike the normal workmen's weekly ticket, the employee's ticket will be subject to an 11 per cent. transport tax, levied by the railway company on behalf of the Reich. Ten-journey tickets will be introduced with a view to stimulate housing schemes on the outskirts of big towns. The tickets are available between towns of more than 100,000 inhabitants and between neighbouring places where a specially heavy traffic is in existence. The reduction amounts to about 20 per cent. of the normal fare. The tickets issued under this heading contain coupons for ten single journeys and are valid for one month from date of issue and are transferable. In express and semi-fast trains full supplements are charged for.

In connection with the general alleviation introduced by the German Government in favour of East Prussia, the railways will issue return tickets from East Prussia to all parts of Germany and *vice versa*, crossing the Polish corridor. The fares will be similar to those charged for winter and summer period tickets, in so far as the reduction is based on a sliding scale. The reduction of the new return tickets starts at 40 per cent. for a journey of between 200 km. and 800 km., rising to 50 per cent. for 801 to 1,000 km. and 60 per cent. for journeys of more than 1,000 km. There is no restriction as to the date of the return journey. The minimum fares will be reduced as follows:—

Third class from 20 Pfg. to 15 Pfg., second class from 30 Pfg. to 20 Pfg., and first class from 50 Pfg. to 30 Pfg.

At the same time platform tickets which now cost 20 Pfg. will be reduced to 10 Pfg. as in former times. The luggage charges—normal and reduced—will also be cut by about 30 per cent.

In addition, to the facilities mentioned above, the summer and winter holiday traffic period tickets issued in recent years during certain months will be available throughout 1934 under the name of holiday tickets. The 25 per cent. cuts in passenger fares for all foreigners and Germans living in America will be increased to 60 per cent. between May 1 (earliest start from a German frontier station or harbour) and October 31, 1934, (latest date of return journey). The tickets are valid for 3 months and will be issued to travellers making a stay in Germany of at least 7 days.

May Timetables, L.N.E.R.

Very few alterations on the previous service are made in the timetables operative on the L.N.E.R. from Monday last. The Hull and Lincoln portion of the 5.45 p.m. express from King's Cross leaves at 5.39 p.m., as is usual during the summer, and on the up journey leaves Hull at 9.10 instead of 9.50 a.m., and arrives in London at 1.15 instead of 1.55 p.m., also as in the summer timetable. Through coaches from Middlesbrough and Sunderland to King's Cross run on the latter train, and a through coach from Sunderland (dep. 7.53 a.m.) is also attached at York to the 8.15 a.m. from Newcastle, due in London at 1.24 p.m. In Scotland there is some acceleration of the Edinburgh–Glasgow service, which for the first time introduces a schedule of 55 min. between the two cities, shared by three expresses. In all, 15 daily trains make the run in between 55 and 60 min., the acceleration in certain cases having been facilitated by the omission of the time-honoured stop at Haymarket. Among other developments of interest may be mentioned new Pullman restaurant-car workings between Edinburgh and Carlisle, and between Glasgow and Dundee, additional to the Glasgow–Edinburgh, Edinburgh–Perth, and Glasgow–North Berwick (Lothian Coast Express) workings of these cars, all operative from June 1, when also a buffet car is to begin working over the Waverley route between Edinburgh and Carlisle. Other changes coming into force from June include the printing on the public time-sheets, as services available also to ordinary passengers, of many express excursion trains, both day and half-day. Among these may be mentioned a 3¼-hour restaurant-car express from Aberdeen to Inverness and back on Thursdays, the well-known Speyside express from and to Aberdeen on Saturdays, three independent restaurant-car trains from Aberdeen to Speyside, Inverness, and Lossiemouth on Sunday mornings, returning in the evening, and other fast Sunday services from Glasgow and Edinburgh to Whitley Bay and back, and King's Cross to Skegness and back.

L.N.E.R. Locomotive Performance

In the issue of THE RAILWAY GAZETTE dated October 20, 1933, some details appeared of actual express locomotive duties involving long mileages which are in daily operation by Pacific engines on the L.N.E.R., regarding which little is usually published. Less is generally known regarding the aggregate daily distances covered by modern tank engines, and although perhaps not so much in the public eye, these types also demonstrate the possibilities of efficient user of the steam locomotive.

The London suburban area with its intensive service, long hours of operating and its numerous outer terminal points providing runs of varying length, affords interesting examples. Great Central 4-6-2 tank engines, for instance, on the Marylebone services which penetrate chiefly into the Buckinghamshire country, have daily turns which each cover distances respectively of 262, 259, 257, 255 (two) and 246 miles. The Great Northern and Great Eastern sections with shorter average runs result in rather lower aggregate mileages than on the Great Central, though it is quite usual for the 0-6-2 tank locomotives of the Doncaster, and the smaller-wheeled Stratford, types to be onerously employed for 18-20 hours out of the 24 for at least five days a week and to make continuous runs on certain duties up to about forty miles in length.

Typical actual workings involving the longest daily mileages in the L.N.E.R. London districts, which also indicate the different classes of work on the respective sections, are as follow:—

G.C. 4-6-2T

Marylebone	dep.	4.0 a.m.
Aylesbury	arr.	5.25 a.m.
,,	dep.	7.02 a.m.
Marylebone	arr.	8.19 a.m.
,,	dep.	8.55 a.m.
Sudbury Hill	arr.	9.13 a.m.
,,	dep.	9.23 a.m.
Marylebone	arr.	9.42 a.m.

To Neasden and back:

Marylebone	dep.	3.25 p.m.
Brackley	arr.	5.27 p.m.
,,	dep.	5.45 p.m.
Marylebone	arr.	7.16 p.m.
,,	dep.	7.40 p.m.
Ruislip	arr.	8.09 p.m.
,,	dep.	8.35 p.m.
Marylebone	arr.	9.05 p.m.

Total miles, 259, including two journeys to and from shed, which is five miles out. 18 hrs.

G.C. 4-6-2T

Neasden Depot	dep.	5.40 a.m.
Chesham	arr.	6.30 a.m.
,,	dep.	6.59 a.m.
Marylebone	arr.	7.49 a.m.
,,	dep.	8.05 a.m.
Sudbury Hill	arr.	8.23 a.m.
,,	dep.	8.37 a.m.
Marylebone	arr.	8.56 a.m.
,,	dep.	12.35 p.m.
Chesham	arr.	1.29 p.m.
,,	dep.	1.40 p.m.
Marylebone	arr.	2.36 p.m.
,,	dep.	5.35 p.m.
Princes Risborough	arr.	6.40 p.m.
,,	dep.	7.00 p.m.
Marylebone	arr.	8.14 p.m.
,,	dep.	9.30 p.m.
High Wycombe	arr.	10.28 p.m.
,,	dep.	10.44 p.m.
Marylebone	arr.	11.40 p.m.

Total miles, 257. 18½ hrs. Also does passenger shunting.

G.N. 0-6-2T

Finsbury Park	dep.	6.11 a.m.
Cuffley	arr.	6.44 a.m.
,,	dep.	7.05 a.m.
King's Cross	arr.	7.45 a.m.
,,	dep.	8.19 a.m.
Cuffley	arr.	8.50 a.m.
,,	dep.	9.00 a.m.
King's Cross	arr.	9.41 a.m.
,,	dep.	10.50 a.m.
Gordon Hill	arr.	11.21 a.m.
,,	dep.	11.34 a.m.
King's Cross	arr.	12.06 p.m.
,,	dep.	1.20 p.m.
Hertford N.	arr.	2.14 p.m.
,,	dep.	2.30 p.m.
King's Cross	arr.	3.24 p.m.
,,	dep.	3.57 p.m.
Potters Bar	arr.	4.32 p.m.
,,	dep.	4.44 p.m.
Moorgate	arr.	5.36 p.m.
,,	dep.	5.46 p.m.
New Barnet	arr.	6.21 p.m.
,,	dep.	6.35 p.m.
King's Cross	arr.	6.55 p.m.
,,	dep.	7.21 p.m.
Hertford N.	arr.	8.12 p.m.
,,	dep.	8.42 p.m.
King's Cross	arr.	9.37 p.m.
,,	dep.	10.31 p.m.
High Barnet	arr.	11.07 p.m.
,,	dep.	11.16 p.m.
King's Cross	arr.	11.53 p.m.
,,	dep.	12.23 a.m.
High Barnet	arr.	1.02 a.m.

High Barnet light engine to King's Cross depot, 246 miles. About 20 hrs.

G.E. 0-6-2T

Wood Street (Walthamstow)	dep.	7.01 a.m.
Liverpool Street	arr.	7.21½ a.m.
,,	dep.	7.34 a.m.
Wood Street	arr.	8.00½ a.m.
,,	dep.	8.15 a.m.
Liverpool Street	arr.	8.36 a.m.
,,	dep.	8.52 a.m.
Chingford	arr.	9.25½ a.m.
,,	dep.	10.39 a.m.
Liverpool Street	arr.	11.03 a.m.
,,	dep.	11.36 a.m.
Chingford	arr.	12.01½ p.m.
,,	dep.	12.39 p.m.
Liverpool Street	arr.	1.03 p.m.
,,	dep.	1.36 p.m.
Chingford	arr.	2.01½ p.m.
,,	dep.	2.59 p.m.
Liverpool Street	arr.	3.03 p.m.
,,	dep.	3.36 p.m.
Chingford	arr.	4.01½ p.m.
,,	dep.	4.40½ p.m.
Liverpool Street	arr.	5.12 p.m.
,,	dep.	5.28 p.m.
Chingford	arr.	5.59 p.m.
,,	dep.	6.25 p.m.
Liverpool Street	arr.	6.56 p.m.
,,	dep.	7.25 p.m.
Chingford	arr.	7.58½ p.m.
,,	dep.	8.44½ p.m.
Liverpool Street	arr.	9.11 p.m.
,,	dep.	9.35 p.m.
Chingford	arr.	10.03 p.m.
,,	dep.	10.41½ p.m.
Liverpool Street	arr.	11.08 p.m.
,,	dep.	11.37 p.m.
Chingford	arr.	12.00 mdnt.
,,	dep.	12.58½ a.m.
Liverpool Street	arr.	1.27 a.m.
,,	dep.	1.36 a.m.
Chingford	arr.	2.06 a.m.

To Wood Street depot, 203 miles. About 19¾ hr.

The distance from Liverpool Street to Chingford is 10¼ miles, and there are nine intermediate stations which are not all called at on certain journeys. During the peak hours very heavy loads are hauled on the Chingford line, as on similar suburban routes, and other tank engine turns provide many instances of only slightly less exacting daily routine.

L.M.S. Ambulance Shield Final Competition

As is invariably the case at this annual function, a large and appreciative audience foregathered on Friday last, April 27, at the Midland Grand Hotel, St. Pancras, to watch the fine work of the competing teams—nine out of the 476 teams who originally participated. The day was a pretty strenuous one for all concerned, as proceedings commenced shortly after nine o'clock in the morning and finished just before four in the afternoon and were characterised throughout with considerable skill and enthusiasm—Crewe Works (Machine Shop) securing the trophy with 473 marks out of a possible 550, and Accrington (Motive Power) and Wolverton Works "A" being second and third respectively. The judges (who at the close were warmly thanked for their services were as follows:—Team Test, Mr. R. Wyse, M.A., M.D. (Birkenhead); Individual Test, Mr. A. Riley, M.B., Ch.B. (Stoke-on-Trent); Viva Voce, Mr. C. Gordon Lewis, M.D., F.R.C.S. (Stoke-on-Trent).

Among those present were: —

Brig.-Gen. Sir Aylmer and Lady Hunter-Weston, Capt. H. P. M. Beames, Miss H. Mervyn, Mr. John Bromley, Mr. A. G. Walkden, Mr. Charles Ker, Mr. A. E. Pullar, Mr. E. J. H. Lemon, Mr. S. J. Symes, Mr. W. E. C. Lazenby, Mr. F. A. Lemon, Mr. A. C. Harris, Mr. G. S. Hill, Mr. W. J. Blake, Mr. A. L. Castleman and Mr. J. A. Milligan.

One end of the large room on the first floor of the hotel where the competition took place was this year specially rigged up with a set piece showing a pleasing domestic interior. One team test in particular—in which a lady named "Mary" and an electric gramophone played an important part—proved to be highly interesting and, in some respects, not unamusing. The gramophone in question explodes and in a few minutes the stage is strewn with bodies—like the last scene in *Hamlet*. The catastrophe, of course, gives the four young ambulance teamsters their chance, and the exceedingly brisk way in which they got to work was loudly and deservedly cheered by kind friends in front.

Renewed interest was added to the procedings when shortly after four o'clock the stage was cleared for a presentation of prizes by Mrs. Denis Mackail, who was accompanied by her father, Sir Guy Granet. Both were formally but very cordially welcomed by Mr. G. L. Darbyshire, Chief Officer for Labour and Establishment, who in a brief speech remarked on the all-round improvement which the day's proceedings had revealed. Mr. Darbyshire expressed his acknowledgments of the good work done by the British International Pictures Limited in so kindly staging the team test alluded to above, and also thanked the medical gentlemen who at some inconvenience to themselves had taken so active a part in the day's competitions. Finally he announced the results of the team tests as follow: Crewe Works (Machine Shop), 473 marks; Accrington (Motive Power), 461½; Wolverton Works "A," 458; Newcastle (Staffs), 455½; Wayfield (Manchester), 448½; Carlisle Traffic, 429½; Liverpool D.G.M.O., 424; Knighton, 416; and Preston (Passenger Station), 400.

Sir Guy Granet said that he had no intention of making a speech, as many of those present had been hard at work since the early morning and would doubtless be glad to get away. As illustrating the need for proficient first-aid service in this country he quoted figures which revealed the serious condition of affairs brought about by the large number of fatal road accidents, which greatly outnumbered those incurred on the railways. Proceeding, he expressed his warm appreciation of the practical interest shown by the various ambulance teams throughout the company's service and the vast amount of work which it entailed on them all the year round. Such work was a wonderful testimony to the public spirit of the staff, and he was not only proud of it but also grateful to them for exhibiting it.

At the close Mrs. Mackail was cordially thanked for the graceful way in which she had presented the prizes.

Final Ambulance Day at Paddington

The closing stage of the Great Western Railway 1934 series of first aid competitions was decided in the General Meeting Room at Paddington on Friday, April 27, when from 10 a.m. teams were competing for the Directors' Challenge Shield and prizes. The tests imposed were realistically staged and the work of the competitors was watched by a number of interested spectators, including Sir Robert Horne, G.B.E., K.C., M.P., Chairman of the Great Western Railway, and other Directors and Officers. The team work was judged by Major J. Orton, Coventry, and the individual tests by Dr. I. H. MacLean, of St. Mary's Hospital, London.

Sir Robert Horne presided at the subsequent presentation, and was supported by Lord Palmer, Deputy Chairman of the Company, Mr. Ralph Cope, Chief Accountant, Mr. J. F. Lean, Principal Assistant to the General Manager, Mr. R. Carpmael, Chief Engineer, Mr. C. T. Cox, Divisional Superintendent, and Dr. H. Cavendish Fuller, Chief Medical Officer. He opened the proceedings by calling upon the Ambulance Centre Secretary, Miss C. A. Ault, to announce the result of the competition. This was as under:—

	Marks.
First—Directors' Challenge Shield and Prizes (South Lambeth)	229
Second—Carvell Cup and Prizes (Pontypool Road)	227
Third—Prizes (Swindon)	222
Fourth—Prizes (Liskeard)	201½
Fifth (Paignton)	201
Sixth (Barry Loco.)	186
Seventh (Weymouth)	183
Eighth (Bourne End)	169

The Chairman congratulated the winning teams, and particularly Pontypool Road, who had won the Inter-railway Shield for the Great Western Railway last year. South Lambeth and Pontypool Road would represent the company in this year's contest with other railways for that trophy, and as the Great Western was second to none he hoped it would keep possession of the headship in this matter. Continuing, Sir Robert said that ambulance work required no public recognition to justify it. When they thought of what their efforts meant in the way of alleviation of human suffering and the saving of human life, they must cherish in their soul the feeling that they were doing something good which elevated the standard of ordinary life. Accidents were inevitable in such a service as theirs. He himself had been brought up in a mining community and had witnessed severe injuries. In the early days less was known as to how to apply remedies. The thought of someone near at hand to bring ready succour brought a feeling of balm which was a great compensation for the horror necessarily felt in connection with accidents. They were able to come and alleviate pain, to bring the remedies which prevented greater injuries being set up. The value of the work they were doing could not be exaggerated. Concluding his address, the Chairman said he had watched some of the work of the competitors that day and if he were ever in such a predicament as the patients, he should hope to have Great Western railwaymen to attend to him.

The Directors' Challenge Shield and prizes were then presented to the winning team, the Carvell Cup and prizes to the runners-up, and prizes also to the third and fourth teams, while the Bourne End team received the Butt Bowl awarded annually to the best Beginners' team in the competitions. Gold, silver, and bronze medals and a number of special framed certificates was also presented for exceptionally efficient first aid rendered by G.W.R. ambulance men during 1933.

"GRAF ZEPPELIN" SOUTH AMERICAN SERVICE. — The Germany - South America airship service will be opened again on May 26, when the *Graf Zeppelin* will leave Friedrichshafen for Brazil. The service will be fortnightly throughout the summer, leaving Friedrichshafen each second Saturday and Rio de Janeiro each second Thursday. Fares have been reduced 20 per cent., return trips costing only about £180.

NOTES AND NEWS

Dust-laying Sprinklers on Locomotives.—Sprinklers designed to spray water on the track to lay the summer dust have been fitted to 140 locomotives on the Canadian National Railways.

Station Cinemas.—The news theatre at Victoria station has proved so popular amongst travellers that a similar cinema is being constructed at Waterloo station, which it is hoped to open in June.

Railway Strike in Malaya.—The whole of Malaya, with the exception of the States of Kedah and Kelantan, is affected by a strike of the daily-paid employees of the railways. Full train services are, however, says Reuters, being maintained for the time being with the help of volunteers.

L. N. E. R. Evening Trips to Southend.—New facilities for spending evenings by the sea are to be afforded by the L.N.E.R. to Londoners. Evening excursions to Southend will leave Liverpool Street at 5.5 p.m. on Saturdays, May 12 and 26, and 5 p.m. on Sundays, May 13 and 27, calling at Ilford only. The return fares will be 2s. from Liverpool Street and 1s. 3d. from Ilford.

Carrying Modern Motor-Cars by Rail.—The development of streamlined designs in the manufacture of motor-cars in Canada and the launching of models longer and wider than their predecessors has made it necessary for the Canadian National Railways to widen the loading doors of wagons used in the transport of motor-cars. The normal loading doors are 10 ft. wide, but the new doors have to be 12 ft. wide and over 500 wagons have been altered accordingly.

Speeding-up Meat Traffic to London, L.M.S.R.—Some 300 tons of meat come into London daily through the city depot of the L.M.S.R. at Broad Street, and new methods are being brought into use to speed up the handling of this traffic. The whole of this meat traffic will, in future, be conveyed in special meat containers, thus ensuring that the contents are kept at an even temperature and are untouched by hand between the point of loading and Smithfield Market. To enable these containers to be transferred from railway wagons on the high level to road vehicles on the low level 30 ft. below, three 10-ton overhead electric cranes working on a gantry 200 ft. long and spanning six sets of lines and a road are being installed at Broad Street. Up to 130 containers of meat will, it is anticipated, be dealt with under this scheme at Broad Street nightly between 11.30 p.m. and 3 a.m. The fresh meat from Scotland comes by special train, leaving points as far north as Aberdeen at 9.45 a.m. and reaching London the same night, while the frozen and chilled meat comes principally from Liverpool; fresh meat is conveyed in ventilated containers and frozen and chilled meat in insulated containers.

Train Travellers Transferred to Canoes.—Passengers in a Canadian National Railways train had an unusual experience between Montreal and Halifax on April 20, when they were transferred into canoes to cross flood waters which barred the train's progress. Mails were also paddled across the flooded areas.

L.N.E.R. Camping Coaches.—The L.N.E.R. is placing camping coaches on public exhibition at the following stations: York (No. 13 platform), Newcastle (No. 15 platform), and Leeds (No. 8 platform). The exhibition will enable intending campers to examine in detail the conveniences offered for an unusual type of holiday. The coaches will remain on exhibition until Whitsuntide.

The Week's Road Accidents.—The Secretary to the Ministry of Transport issues the following return, for the week ended April 21, of persons killed or injured in road accidents:—

	Killed in accidents reported during the week	Reported during the week as having died as the result of accidents occurring in previous weeks	Injured in accidents reported during the week
	No.	No.	No.
England ...	95	21	3,694
Wales ...	4	1	138
Scotland ...	10	2	349
Great Britain	109	24	4,181

The total fatalities of the week as the result of road accidents are therefore 133, as compared with 117 for the preceding week.

Important Brake Contract for London Tube Lines.—Almost simultaneous with the signing of the contract for the supply of freight brake equipment for the Polish State Railways, which we recorded last week, the Westinghouse Brake & Saxby Signal Co. Ltd. received an order from the London Passenger Transport Board for the supply of electro-pneumatic brake equipment for the whole of the rolling stock on the Edgware, Morden, and Highgate tube line. Similar equipment, it will be recalled, has been used with satisfactory results for some time throughout the Piccadilly Line, and on certain of the District Line rolling stock. The total number of vehicles which will be equipped under this new order is between 750 and 800. An illustrated description of the Westinghouse electro-pneumatic brake equipment as fitted to Metropolitan District Railway coaches appeared on page 779 of the issue of THE RAILWAY GAZETTE for May 24, 1929.

London Transport Bill.—The day appointed for the consideration of the London Passenger Transport Board Bill by a Select Committee of the House of Commons (Group E) is Tuesday, May 15.

Sunday Trains for L.M.S.R., Stanmore Branch.—Commencing on May 6 the L.M.S.R. is introducing a Sunday train service on the branch line from Harrow and Wealdstone station to Belmont and Stanmore. From 9 a.m. to 11 p.m. approximately there will be a 20-minute service of trains in each direction, except between 1 p.m. and 2 p.m. when trains will run at a 40-minute interval.

North Wales Observation Cars.—The L.M.S.R. observation cars began to run this season between Llandudno and Llanberis on Monday last, April 30. Between Llandudno, Bettws-y-coed, and Blaenau Festiniog they will come into service on May 21, and between Rhyl, Colwyn Bay, and Llanberis on June 25. A small supplemental fare is charged for travelling in these cars, which are fitted with large plate-glass windows so as to give an unrestricted view of the scenery, and are accompanied by a conductor who points out places of interest *en route*.

Road and Rail in Ulster.—Sir Felix Pole, Chairman of Associated Electrical Industries Limited, and formerly General Manager of the Great Western Railway Company, who has been asked to go to the Northern Ireland Home Office to report on transport problems in Ulster, arrived in Belfast on Monday morning, April 30. Later in the day Sir Felix Pole began his task of inquiring into road and rail transport conditions in Northern Ireland, and heard evidence by the London Midland & Scottish Railway Company (Northern Counties Committee) and the Belfast Omnibus Company. The Ulster Farmers' Union will submit evidence later. The inquiry is in connection with the proposed Bill of the Government for co-ordination of road and rail transport.

Travelling Circus Train.—As the result of his successful experience last year, Mr. Bertram Mills, the famous circus proprietor, has again requested the four main line railway companies to arrange for the conveyance by railway of his travelling circus throughout the summer. The nature of this task can be gauged by the fact that, apart from the large number of artistes, staff and their extensive baggage and equipment, over 100 animals have to be transported, including elephants, tigers, zebras, horses, ponies, &c. Altogether 47 vehicles are utilised in connection with the task, these being of such a diverse character as an elephant truck, a 45-ft. covered van for tigers, a similar vehicle for smaller wild beasts, 17 horse boxes, 5 covered cattle trucks, &c. In addition, suitable vehicles have to be provided to accommodate the whole of

the circus equipment, tents, seating accommodation, motor lorries, tractors and caravans, while satisfactory loading and unloading facilities have to be provided. The essential feature of such an extensive circus tour is reliability of transport between the places at which the circus shows are given, and the fact that Mr. Mills has asked the four railway companies to repeat last year's arrangements is an indication that their organisation has fully met the somewhat unusual requirements.

Russian Underground Exhibit.—At the great holiday festival held in Moscow on May 1 and 2, the principal exhibit in the Lubianka square was an enormous illuminated model of an underground station, the purpose of which was to show the Muscovites what will be theirs when the underground railway is completed.

History of the Southern Railway.—A history of the Southern Railway is being compiled by Mr. Dendy Marshall, the author of the "Centenary History of the Liverpool & Manchester Railway." He will be much obliged if anyone possessing any interesting documents or matters suitable for illustration will communicate with him at Chinthurst Lodge, Wonersh, Guildford. Information with regard to early South Eastern engines is specially wanted.

Kofler Train Stop.—Further trials were made in April on the electrified section of the Nord-Milan Railway, in the presence of numerous officials and engineers, of the Kofler mechanical train-stop apparatus, already described in THE RAILWAY GAZETTE of August 26, 1932, and we are able to reproduce, on page 798, illustrations showing the locomotive and track apparatus, which is reported as having worked satisfactorily at speeds up to 80 k.p.h. (50 m.p.h.).

L M S Magazine.—Commencing with the May issue, the publication date is the first instead of the tenth of the month, thus bringing the staff magazine of the L.M.S.R. into line with the majority of monthly periodicals. Furthermore, the penny edition is enlarged by 16 pages, and contains local news covering the entire system instead of one particular area. An art edition, similar in contents, but printed on art paper, is on sale at twopence, and insurance editions at twopence (ordinary), or threepence (art) are also available.

Railway Conciliation Machinery.—At the request of the executives of the National Union of Railwaymen and the Railway Clerks' Association, the railway General Managers met on May 2 representatives of the two unions and discussed the question of providing new conciliation machinery to replace the National Wages Board. The meeting was devoted to the consideration of the main objections raised by the unions to the proposals for a new tribunal of three independent members, with hearings in private. A further meeting will be held at which the attitude of the companies will be explained to the unions.

Trans-Persian Railway.—A Bill was passed on March 13 last by the Persian Parliament authorising the appropriation of 180,000,000 rials from sugar and tea taxes during the year ending March 20, 1935, for work on the Trans-Persian Railway.

French Railways Reorganisation Act.—In the article on page 731 of last week's issue two sums given in francs were shown as being equivalent to £150 and £800 respectively. These, unlike all the other sums quoted in the article, were converted at par, but at the current rate of about 80 fr. to the £1 they are £250 and £1,250.

Road and Rail Traffic Act, 1933.—The Minister of Transport has made the Road and Rail Traffic Act, 1933 (Date of Commencement) Order (No. 1), 1934, the effect of which is to bring the licensing system into operation on the following dates:—(*a*) as regards all vehicles the use of which is required by the Act to be authorised by a C licence on July 1, 1934; and (*b*) as regards all vehicles the use of which is required to be authorised by an A or a B licence on October 1, 1934. No regulations have yet been made regarding the form in which records are to be kept by holders of licences.

Launch of Southern Railway Steamer "Sandown."—The paddle steamer *Sandown*, which has been constructed for the Southern Railway's service between Portsmouth and the Isle of Wight, was launched on May 1 at Dumbarton, Scotland. The ceremony, which was performed by Mrs. Missenden, the wife of Mr. E. J. Missenden, C.B.E., Docks and Marine Manager, Southern Railway, took place at the Leven shipyard of William Denny & Bros. Ltd., the builders of the vessel. The new steamer is 223 ft. long, 52 ft. 6 in. broad overall, and has a speed of 14½ knots.

Railway Students' Association Visits.—At the invitation of the London Passenger Transport Board (Railways) and under the direction of Mr. R. Falshaw Morkill and Mr. A. J. Webb, a party of approximately 35 members of the Railway Students' Association inspected the signal installations at Aldersgate and Farringdon Street on the evening of April 25. In the course of the inspection the members were shown over the box at each of the stations, when the workings of the multifarious signals and track circuits, &c., were fully explained. At the conclusion of this most instructive and interesting visit, the party was entertained in the Farringdon Street station dining room. In spite of adverse weather conditions, a party of approximately 40 members of the Railway Students' Association inspected the Whitemoor Concentration Yards, March, L.N.E.R., on the afternoon of April 28, with the permission of the L.N.E.R. Both the down and up yards were inspected, and also the two control towers, the working of the retarders, and the automatic operation of the points. The arrangements were made by Mr. H. H. Mauldin, Superintendent (Eastern Section), L.N.E.R.

Shropshire Railways.—Mr. A. E. Chick, of 16, Devonshire Square, E.C., has resigned his position of Secretary, and Mr. James Arthur Iggulden, of 23, Salford Terrace, Tonbridge, Kent, has been appointed Secretary *pro tem.*

Montrose L.M.S.R. Station Closed.—The L.M.S.R. station at Montrose was closed on April 30, after 84 years of existence. All passenger traffic is now dealt with at the L.N.E.R. station, where alterations have been made.

The Railway Club.—At the meeting of the Railway Club, on April 13, Mr. C. N. Anderson read a paper on the London, Chatham & Dover Railway. The complicated history of this line was traced in detail, and it was pointed out that the root of the troubles with the South Eastern Railway was really a personal quarrel between the chairmen of the two companies, Staats Forbes of the L.C. & D.R., and Edward Watkin of the S.E.R.

Railway Students' Association.—At the annual general meeting of the Railway Students' Association (London School of Economics and Political Science), which was held in Houghton Street, Aldwych, on Monday, April 30, it was disclosed that the membership now stands at 542, an increase of 77 over the preceding year, the figures being:—G.W.R., 93; L.N.E.R., 163; L.M.S.R., 91; Southern Railway, 132; London Passenger Transport Board, 54; other interests, 9. There are also 12 honorary members.

British Railway Stockholders' Union.—A stirring brochure has been issued by the British Railway Stockholders' Union pointing out the value of organisation and urging every railway stockholder to become a member with a minimum subscription of 5s. a year. Diagrams included in the brochure show that in 1913 holders of ordinary stocks received 2s. 10d. out of each £1 earned, whereas in 1933 they received 1d., nothing being paid on the ordinary stocks of two of the group companies. The aims of the Union are to see that the British railways get fair play and that the stockholders get justice.

American Railway Wages.—The Labour Executive Association of the United States railroads has agreed to a restoration of the 10 per cent. wage reduction which has been in force for two years. Mr. A. F. Whitney, Chairman of the Association, announces that this agreement has been made to comply with the wish of the President of the United States in the interest of national recovery. Two and a half per cent. will be restored on July of

this year, an additional 5 per cent. in January, 1935, and another 2½ per cent. in April, 1935. The agreement runs for a year.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of March amounted to $9,946,000, an increase of $1,146,000 over March, 1933. Working expenses, including pensions, were $8,427,000, an increase of $505,000, and net earnings, at $1,519,000, showed an advance of $641,000. For the period January 1 to March 31, 1934, gross earnings were $27,487,000, an improvement of $3,914,000 on the first quarter of 1933, and net earnings amounted to $3,227,000, an increase of $1,929,000.

Canadian National Earnings.—For the month of March the gross earnings of the Canadian National Railways were $14,278,648, an increase of $2,879,433 in comparison with March, 1933. Working expenses amounted to $12,679,689, an increase of $1,025,167, and the net earnings of $1,598,959 showed an improvement of $1,854,266. The gross earnings of $37,366,442 for the period January 1 to March 31, 1934, showed an improvement of $6,788,415 on those for the first quarter of 1933, and net earnings were $65,002, compared with a deficit of $4,023,243 for the corresponding period of 1933.

Institute of Transport: Metropolitan Graduate and Student Society.—The thirteenth annual report states that the total membership at March 31, 1934, was 260, which represents an increase of 13 over last year's figure. During the session 41 members joined and 28 severed their connection with the society. The following analysis shows how the membership is distributed among the various forms of transport:—Southern Railway, 59; L.N.E.R., 36; L.M.S.R., 28; G.W.R., 21; Canadian National Railways, 1; Railway Research Service, 1; L.P.T.B., 52; Port of London Authority, 21; Canals, 1; Shipping companies, 1; Road transport (passenger), 7; Road transport (goods), 6; Air transport, 1; and Others, 25.

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 17th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,940¾ mls.)	£	£	£	£	£	£
Passenger-train traffic...	427,000	432,000	— 5,000	6,662,000	6,643,000	+ 19,000
Merchandise, &c. ...	462,000	441,000	+ 21,000	7,526,000	6,782,000	+ 744,000
Coal and coke ...	207,000	209,000	— 2,000	4,407,000	4,127,000	+ 280 000
Goods-train traffic ...	669,000	650,000	+ 19,000	11,933,000	10,909,000	+ 1,024,000
Total receipts	1,096,000	1,082,000	+ 14,000	18,595,000	17,552,000	+ 1,043,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	265,000	274,000	— 9,000	4,327,000	4,324,000	+ 3,000
Merchandise, &c. ...	332,000	304,000	+ 28,000	5,359,000	4,707,000	+ 652,000
Coal and coke ...	230,000	208,000	+ 22,000	4,177,000	3,743,000	+ 434,000
Goods-train traffic ...	562,000	512,000	+ 50,000	9,536,000	8,450,000	+ 1,086,000
Total receipts	827,000	786,000	+ 41,000	13,863,000	12,774,000	+ 1,089,000
G.W.R. (3,750 mls.)						
Passenger-train traffic...	179,000	189,000	— 10,000	2,796,000	2,827,000	— 31,000
Merchandise, &c. ...	184,000	179,000	+ 5,000	3,000,000	2,700,000	+ 300,000
Coal and coke ...	99,000	105,000	— 6,000	1,833,000	1,770,000	+ 63,000
Goods-train traffic ...	283,000	284,000	— 1,000	4,833,000	4,470,000	+ 363,000
Total receipts	462,000	473,000	— 11,000	7,629,000	7,297,000	+ 332,000
S.R. (2,177 mls.)						
Passenger-train traffic...	259,000	262,000	— 3,000	4,174,000	4,147,000	+ 27,000
Merchandise, &c. ...	69,000	72,500	— 3,500	1,027,500	986,000	+ 41,500
Coal and coke ...	30,000	29,500	+ 500	596,500	552,000	+ 44,500
Goods-train traffic ...	99,000	102,000	— 3,000	1,624,000	1,538,000	+ 86,000
Total receipts	358,000	364,000	— 6,000	5,798,000	5,685,000	+ 113,000
Liverpool Overhead ... (6¼ mls.)	1,015	1,027	— 12	18,258	17,771	+ 487
Mersey (4½ mls.) ...	3,889	3,768	+ 121	71,261	67,851	+ 3,410
*London Passenger Transport Board ...	540,700	—	—	21,573,400	—	—
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,976	2,068	— 92	31,510	32,045	— 535
" " goods	551	655	— 104	9,174	8,816	+ 358
" " total	2,527	2,723	— 196	40,684	40,861	— 177
Great Northern pass. (562 mls.)	6,500	5,950	+ 550	126,950	62,150	+ 64,800
" " goods	8,750	9,450	— 700	139,800	63,750	+ 76,050
" " total	15,250	15,400	— 150	266,750	125,900	+ 140,850
Great Southern pass. (2,168 mls.)	20,033	20,863	— 830	327,357	318,192	+ 9,165
" " goods	32,966	32,645	+ 321	545,950	525,104	+ 20,846
" " total	52,999	53,508	— 509	873,307	843,296	+ 30,011

* 43rd Week.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices May 2, 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	31	56½	−1½
5% Con. Prefce. ...	109¾	69½	110½	—
5% Red.Pref.(1950)	109¼	87½	109½	—
4% Deb.	108 15/16	99¼	108½	—
4½% Deb.... ...	108	100¾	110½	—
4½% Deb.... ...	116	106	117½	—
5% Deb.	128	117¼	128½	—
2½% Deb.... ...	65	60	69½	—
5% Rt. Charge ...	124	111½	126½	—
5% Cons. Guar. ...	122	103	123½	—
L.M.S.R.				
Ord.	29⅞	12⅛	26½	−½
4% Prefce. (1923)	51	17	55½	−1
4% Prefce. ...	72	33¼	78	−½
5% Red. Prf. (1955)	93	47¼	99	—
4% Deb.	103¼	89½	103	—
5% Red.Deb.(1952)	114	105	113½	—
4% Guar.	97¼	68⅝	98½	—
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	19½	−¼
Def. Ord.	10¾	4⅛	9⅞	−⅛
4% First Prefce. ...	65½	19⅜	66½	—
4% Second Prefc .	40½	12¼	38	−1
5% Red.Pref.(1955)	83¾	27	87	—
4% First Guar. ...	94¾	58¼	96	—
4% Second Guar.	89¼	48	90	—
3% Deb.	77	60¼	78	−½
4% Deb.	102¾	80	102	−½
5% Red.Deb.(1947)	112	102½	108½	—
4½% Sinking Fund Red. Deb.	107½	98¾	106½	—
SOUTHERN				
Pref. Ord.... ...	71	27¾	77	−2
Def. Ord.	24⅝	9⅜	27	−½
5% Prefce. ...	107 11/16	74	110½	—
5% Red.Pref.(1964)	107¾	78⅞	111½	—
5% Guar. Prefce.	124¼	102¾	124½	—
5% Red.Guar.Pref. (1957)	115⅝	103½	114½	—
4% Deb.	107½	96¾	105½	—
5% Deb.	126½	114¼	126½	—
4% Red. Deb. 1962–67	107¼	100	106½	—
BELFAST & C.D.				
Ord.	6	4	5	—
FORTH BRIDGE				
4% Deb.	99½	95½	101½	—
4% Guar. ...	98½	94	101½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	5	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	20	–
Prefce.	24	12⅛	15	—
Guar.	42	16¾	43	—
Deb.	60	30⅞	65	—
L.P.T.B.				
4½% "A" ...	117⅞	112	118½	—
5% "A"	127¼	119¼	128½	+½
4½% "T.F.A." ...	111¼	106	109½	—
5% "B"	122½	114	120½	—
"C"	86¾	74½	79½	—
MERSEY				
Ord.	16¼	5	15	+2
4% Perp. Deb. ...	83	63⅞	87½	—
3% Perp. Deb. ...	62	51	65½	—
3% Perp. Prefce....	50⅝	27	53½	—

* ex-dividend.

CONTRACTS AND TENDERS

Railcars for India

Sir W. G. Armstrong, Whitworth & Co. (Engineers) Ltd. has received an order from the Madras & Southern Mahratta Railway for six oil-electric railcar double-bogie chassis for the 5-ft. 6-in. gauge.

Guest, Keen & Nettlefolds Limited has received an order from the Argentine North Eastern Railway for 60,000 steel fishbolts for 55-lb. rails.

Howell & Co. Ltd. has secured an order from the Buenos Ayres Great Southern Railway for 350 m. and 2,300 lengths of solid-drawn black steel Aquacidox boiler tubes.

F. Morton & Co. Ltd. has received an order from the Nyasaland Railways for a steel-framed building for the accommodation of electric generating power and lighting plant at Limbe.

The Patent Shaft & Axletree Co. Ltd. has received an order from the Central Uruguay Railway for three pairs of steel cylinders, 3 ft. 3 in. diam. by 23 ft. 6 in. high, with built-up channel bracing and weighing approximately 35 tons, for repairs to Santa Lucia bridge.

D. Wickham & Co. Ltd. has received orders for six No. 8 light petrol-driven inspection cars, of which three are for the Entre Rios Railways and three for the Argentine North Eastern Railway, and also further orders for four motor trolleys and four trailers for the L.N.E.R.

The Westinghouse Brake & Saxby Signal Co. Ltd. has received a contract from the London Passenger Transport Board for the supply of electro-pneumatic brake equipment for the whole of the rolling stock on the Edgware, Morden, and Highgate line. This order is consequent upon the satisfactory results obtained from the use of this equipment for some time past on the whole of the Piccadilly Line stock and on certain of the District Line stock. The total number of vehicles to be equipped under the new order is between 750 and 800.

Peruvian Locomotive Orders

Beyer, Peacock & Co. Ltd. has received an order from the Peruvian Corporation Limited for three 2-8-0 type tender locomotives for the Central Railway of Peru. These engines will be of new and completely modern design, having bar frames and equipped with grease lubrication, Nicholson thermic syphons, Stone's electric lighting and bronzes, Davies & Metcalfe exhaust injector, and M.L.S. multiple-valve regulator. The engines are required for passenger service up the 75 miles of 1 in 25 uncompensated grade, this railway being the most severe steam-operated adhesion line in the world. The tractive effort at 75 per cent. boiler pressure will be 32,300 lb., the boiler pressure being 200 lb. per sq. in. The engines, which will be oil-fired, will each have an approximate total weight of 108 tons. The tenders will have two four-wheel bogies.

The Chinese Government Purchasing Commission has placed the following orders for equipment to the inspection of Messrs. Fox & Mayo, consulting engineers :—

John Holroyd & Co. Ltd. : One motor-driven plain grinding machine.

George Green & Co. Ltd. : One steel converter with capacity of 1 ton per hour.

G. D. Peters & Co. Ltd. has recently received orders for rolling-stock equipment as follow :—

Glasgow Subway Electrification : 40 car sets of electro-pneumatic door-operating equipment.

L.P.T.B. Underground Stock : 26 car sets of electro-pneumatic door-operating equipment for new coaches under construction by the Metropolitan-Cammell Carriage, Wagon & Finance Co. Ltd.

San Paulo Railway : One train set consisting of 76 auto-controlled revolving seats for diesel-electric stock, for direct shipment to Brazil.

The Egyptian State Railways Administration has placed orders as follow :

For india-rubber goods for vacuum brake : adjudication of February 12, reference No. E.S.R. 21.88 of December 7, 1933. Thirteen offers received and orders placed with Avon India Rubber Co. Ltd., London, for items Nos. 1 to 11, total cost £134 9s. 10d. ; The Clyde Rubber Works Co. Ltd., Renfrew, for items Nos. 14 to 19, total cost £52 6s. 0d. delivered f.o.b. Glasgow ; and The African Rubber Company, Cairo, for items Nos. 12 and 13, total cost L.E. 244 delivered free Cairo.

For mild steel square bars : adjudication of February 28, reference No. E.S.R. 301.G.3/6. Six offers received and contract placed with H. J. Skelton & Co., London, for supply of Administration's requirements during one year at an approximate cost of £763, for delivery c.i.f. Alexandria.

Locomotives for China

The Hunslet Engine Co. Ltd. has received from the Chinese Government Purchasing Commission orders for locomotives as follow :—

One 0-8-0 side and back tank locomotive, 4-ft. 8½-in. gauge, for the Nanking train ferry. This engine has outside cylinders 22½ in. diam. by 26 in. stroke ; total heating surface, 1,694 sq. ft. ; grate area, 24·6 sq. ft. ; total weight empty, 65 tons ; and total weight loaded, about 83½ tons.

Four 4-8-0 type locomotives with double bogie tenders, 4-ft. 8½-in. gauge, for the Hangchow Kiangshan Railway. These engines have cylinders 410 mm. diam. by 550-mm. stroke ; total heating surface, 1,247 sq. ft. ; grate area, 19·4 sq. ft. ; total weight of engine and tender empty, 57½ tons, and loaded, 76½ tons.

The engines and tenders in these orders are similar, with slight modifications, to those supplied by The Hunslet Engine Co. Ltd. to China last year and described and illustrated in issues of THE RAILWAY GAZETTE for August 4, 1933, and January 12, 1934, respectively for the 0-8-0T and the 4-8-0 tender locomotives.

J. Stone & Co. (India) Ltd. has received an order from the Indian Stores Department for six sets of 24 cells each J. Stone & Co.'s type IS15 acid train lighting cells, at a price of Rs. 12,528 ; five sets of 38 cells each Saft Co.'s Nickel-Iron type S7F alkaline train lighting cells at a price of Rs. 12,825 ; and three sets of 38 cells each of type S10F alkaline train lighting cells, at price of Rs. 10,545, free delivery.

Nasmyth Wilson & Co. Ltd. has received an order from the North Western Railway of India for one saturated steam locomotive boiler for "G" class locomotive at a price of Rs. 11,560 c.i.f. Karachi.

Britannia Batteries Limited, of London, Calcutta branch, has received an order from the Indian Stores Department for 14 sets of 24 cells each A.F.A. Works (Hagen) type 17-G.O. 36 acid train lighting cells, at a price of Rs. 23,751, free delivery.

Heatly & Gresham Limited has received an order from the Indian Stores Department for three sets of 24 cells each Batteries Limited, Redditch, type AG20 alkaline cells for electric trucks at a price of Rs. 7,020, and one set of 24 cells type T22 alkaline cells at a price of Rs. 2,556, free delivery.

The Chloride Electrical Storage Co. Ltd. has received an order from the Indian Stores Department for six sets of 24 cells each of type RTG5 acid train lighting cells, at a price of Rs. 10,098, and nine sets of 24 cells each RTG9 type acid train lighting cells at a price of Rs. 23,679, free delivery.

The Consolidated Pneumatic Tool Co. Ltd. has received an order from the Indian Stores Department for one set of pumping plant comprising C.P.T. class P6-DG vertical compresser, Ruston mark 4VXA vertical oil engine and Mather & Platt two-stage medivane centrifugal pump at a price of Rs. 24,214, free delivery Rawalpindi station and erection.

Boilers for Indian Locomotives

The Madras & Southern Mahratta Railway has placed orders for broad-gauge locomotive boilers as follows :— Vulcan Foundry Co. Ltd. : Six for AS class 4-6-0 passenger locomotives, four for DS class 2-8-0 goods locomotives, and three for FS class 2-6-4T locomotives ; R. & W. Hawthorn, Leslie & Co. Ltd. : Two for VS class 0-6-0 goods locomotives.

Tenders are invited on a rupee basis, and receivable by the Agent, North Western Railway of India, Lahore, by May 31, for the supply of locomotive connecting and coupling rods, crossheads, follower plates, and grease nipples, steel brick arch tubes, packing and mounting rings, pressure gauges, and brass balls for gauge glass cocks.

The Stores Purchase Committee, Government of Mysore, Bangalore, invites tenders through Messrs. Rendel, Palmer & Tritton, 55, Broadway, Westminster, S.W.1, receivable by July 2, for bogie carriage underframes ; by July 10, for metre gauge H.B.D. cranes and narrow gauge covered goods wagons ; by July 18 for locomotive wheel balances and a surface traverser. Tenders are also invited, receivable by June 11, for the supply of railway workshop machinery required for the Mysore Railways during the year 1934-35

LEGAL AND OFFICIAL NOTICES

The Chinese Government Purchasing Commission

THE Commission is prepared to receive Tenders from British manufacturers only for the supply of :—

(a) 1,360 Tons of 43-kg. RAILS, 103 Tons of FISHPLATES and 820 Tons of BEARING PLATES.

(b) 10 Tons of FISHBOLTS and 170 Tons of DOGSPIKES.

Tender Forms can be obtained at the offices of the Consulting Engineers, MESSRS. SANDBERG, 40, Grosvenor Gardens, London, S.W.1.

Non-returnable fees will be charged for each set of documents as follows : (A) £1, (B) 10s.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for :—

8 STEEL FIREBOXES FOR G.S. CLASS ENGINES.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Tuesday, 1st May, 1934.

A fee of 10s. will be charged for each copy of the Specification, which is NOT returnable.

Tenders must be submitted not later than noon on Thursday, 24th May, 1934.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
R. GRANT,
Secretary.

SERVICES of Chief Operating Superintendent of a premier railway available. Desires engagement in Transport undertaking. Thorough all-round experience in commercial transport work. Highest credentials. Can be interviewed after first week in May.—Box "A. E.," c/o STREETS, 6, Gracechurch Street, London, E.C.3.

Universal Directory of Railway Officials and Railway Year Book

39th Annual Edition, 1933-34.

Price 20/- net.

THE DIRECTORY PUBLISHING CO. LTD., 33, Tothill Street, London, S.W.1.

RAILWAY AND OTHER REPORTS

Nitrate Railways.—The results of working for the year 1933 show improvement compared with those of 1932, but, owing to the difficulties of exchange and inability to obtain remittances, the directors have decided not to recommend the payment of a dividend on the ordinary, preferred, or deferred converted ordinary shares in respect of the year 1933.

Robert Stephenson & Co. Ltd.—A loss of £12,787 is reported for 1933 (against a loss of £7,160 for 1932). A dividend of 4 per cent. is again to be paid for the year and in order to do this and to extinguish the loss a transfer of £20,000 is made from reserve for contingencies. The credit balance to go forward is reduced from £3,935 to £2,897.

George Spencer, Moulton & Co. Ltd.—A net profit of £538 is shown for 1933 (against a net loss of £16,682 for 1932). This is carried forward. The last dividend was for 1930. The directors state that trading conditions in the home market improved in the latter part of the year, but export trading remained severely affected by exchange and tariff restrictions.

Yorkshire Traction Co. Ltd.—This company, which is jointly controlled by the L.M.S. and L.N.E. Railway Companies and by Tilling & British Automobile Traction Limited, secured in 1933 a profit of £24,841. With the addition of £23,179 brought in, the total amount available is £48,020. It is proposed to appropriate £10,225 to reserve, to pay 10 per cent. on the ordinary shares, and to carry forward £21,091. The balance of the 4½ per cent. debenture stock outstanding (£4,500) was redeemed during the year.

William Beardmore & Co. Ltd.—The trading loss on operating departments was reduced from £116,542 in 1932 to £85,465 in 1933. In addition, charges incurred in departments closed down, including a reserve of £10,000 for obsolescence of stocks, came to £22,611, against £14,507 ; and losses in subsidiary companies amounted to £12,106. Last year £37,369 was written off against reserves in this respect. After charging £54,543 for interest on first mortgage debenture stock accrued but not paid in terms of the moratorium scheme, and making allowance for various minor debits and credits, there is a net loss for the year of £164,024 (against £177,501 which increases the debit at profit and loss acocunt to £732,946.

Johnson & Phillips Limited—For 1933 the net profit, after providing for debenture interest, depreciation, &c., amounted to £37,077, as against £21,341 for 1932. The research and development account again receives £5,000, and the dividend is maintained at 5 per cent. A year ago, however, a sum of £10,000 was taken from dividend equalisation account for paying this dividend, whereas no such transfer is now necessary, and the balance forward is increased from £99,058 to £101,134.

Babcock & Wilcox Limited.—Manufacturing profits for 1933, after depreciation, were £97 758, against £147,461 for 1932. Income from investments was rather larger, and after meeting general charges the balance of net profit available was £242,180, comparing with £219,244 for 1932. A transfer of £50,000, as against £125,000 in 1932, is made from dividend-equalisation fund, which makes possible the payment of an ordinary dividend of 6 per cent. for the year (as against 7½ per cent. and a special dividend of 1½ per cent. for 1932), leaving £23,388, as compared with £21,056, to be carried forward.

Thos. Firth & John Brown Limited.—Substantial improvement is shown by the accounts for 1933. The balance from trading account, including income from investments, is £161,017, which compares with a loss of £13,432 for 1932, and after meeting debenture and other interest there is a profit of £102,519, against a loss of £75,950. The directors have decided to transfer £90,000 to depreciation reserve (against nil), and the remainder of the profit is added to the balance forward, making it £17,882. The directors state that all branches of the business have contributed to the better result. Dividends on both classes of preference shares are in arrear as from January 1, 1931.

Stewarts and Lloyds Limited.—Accounts show a rise in net profits from £119,993 for 1932 to £459,552 for 1933, after providing for taxation and depreciation. As already announced, a dividend is proposed of 2½ per cent. on the deferred shares. Allocations are proposed of £30,000 to special depreciation reserve, £65,000 to income-tax reserve, £10,000 to employees' benefit reserve, and £150,000 to general reserve. These allocations compare with nil a year ago. The balance forward is increased from £156,738 to £158,126.

G.W.R. AMBULANCE PRESENTATION AT WORCESTER.—The Guildhall, Worcester, was the scene of the annual gathering of ambulance workers in the Worcester Division on April 18, when Mr. J. F. Lean, Principal Assistant to the General Manager, G.W.R., distributed competition trophies, prizes, and medals. Mr. H. J. Peacock, Divisional Superintendent, presided. Mr. Lean congratulated the division particularly on the large number of efficiency medals he was called upon to present. It was continued efficiency, he said, which stood the ambulance worker in good stead in time of need. He stressed the necessity of getting the younger men interested in the movement in order to carry on the work. Notwithstanding the depression, the Great Western centre had kept up remarkably well its record of examinations. He paid special tribute to the good work of Mr. W. J. Waite, who had been Divisional Secretary since 1913, and voiced the debt due to the medical profession. Mr. Lean then presented the Kilbourne Kay Shield to the Locomotive Running (Advanced) team, competition prizes, long-service medals and examination awards to members of the several classes in the division. The Kilbourne Kay Cup (Beginners' trophy) was presented to the Kidderminster team by Mr. Higgins.

Railway Share Market

Business was resumed in the stock and share markets on Wednesday after the usual May 1 holiday. Markets were firm with less active business in most sections, and Home railway stocks remained steady at the former quotations, but with only a moderate amount of interest being taken in stocks pending the clearing up of the uncertainty regarding the wages question. Great Western ordinary stock continued to find buyers on the view that the directorial dividend policy appears to assure a distribution of 3 per cent. per annum so as to keep the company's stocks within the trustee list.

It is not possible to obtain as much as 5½ per cent. in any other stock with an equal assurance of the return being forthcoming. Southern preferred and deferred stocks attracted some attention on the references made by Sir Herbert Walker to the successful outcome of the company's experiment in main line electrification. There is relatively little stock on the market at the present time, but a small amount of the company's 4 per cent. debenture stock is available at around 106 to give a yield of £3 16s. per cent. The same company's 5 per cent. preference stock is offered at 110½, at which price the buyer obtains a return of over 4½ per cent. on his capital, or about 1 per cent. more than is obtainable on British Government stock. The interest on this stock was well covered by last year's net revenue, and it is considered to represent one of the best 4½ per cent. yielding stocks in the market at the present time. The 4 per cent. first guaranteed stock does not give a yield of more than £4 3s. 9d. per cent., as the market is unwilling to sell the stock at less than 96, since there are few former trustee securities still obtainable in the home railway market at below par. Many trustees, whilst not restricted to strictly trustee stocks, are disinclined to invest trust funds in stocks at par. It may be added that in other directions there is on offer a limited amount of Great Western 5 per cent. debenture stock at a price which yields £3 14s. 3d. per cent. and a quantity of London Midland & Scottish 4 per cent. debenture stock at a price which yields £3 18s. 3d. per cent.

Foreign railway stocks have been quiet. San Paulo ordinary stock was firm, with the dividend increase remaining a good influence in this market. Leopoldina preference stock fell. A good feature was a rise in Nitrate Railway shares on the favourable view taken of the Chilean nitrate recovery. Canadian Pacific preference stock was harder on references to prospects of dividend resumption.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933–34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: May 2, 1934	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	29.4.34	10,670	− 1,570	17	219,970	161,410	+ 58,560	Ord. Stk.	26	11¾	24	Nil
	Argentine North Eastern..	753	28.4.34	11,300	+ 800	43	442,400	459,100	− 16,700	,,	14½	5	8½	Nil
	Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	Mar., 1934	7,700	− 950	13	20,650	23,850	− 3,200	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13	37/8
	Buenos Ayres & Pacific ..	2,806	28.4.34	145,000	+ 8,000	43	4,711,000	4,767,000	− 56,000	Ord. Stk.	26	97/16	131/2	Nil
	Buenos Ayres Central ..	190	22.4.34	$99,000	− $9,500	43	$4,599,703	$4,440,139	+ $159,564	Mt. Db.	30	10	23	Nil
	Buenos Ayres Gt. Southern	5,085	28.4.34	193,000	− 40,000	43	8,738,000	8,791,000	− 53,000	Ord. Stk.	44½	21½	29	Nil
	Buenos Ayres Western ..	1,926	28.4.34	90,000	+ 10,000	43	2,915,000	2,912,000	+ 3,000	,,	34½	15¾	22	Nil
	Central Argentine ..	3,700	28.4.34	‡187,000	—	43	7,161,000	7,806,000	− 645,000	,,	28½	15	18	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	11½	Nil
	Cent. Uruguay of M. Video	273	28.4.34	17,228	+ 1,375	43	707,184	653,474	+ 53,710	Ord. Stk.	20	8	15	Nil
	Do. Eastern Extn.	311	28.4.34	5,152	+ 1,443	43	145,174	141,638	+ 3,536	—	—	—	—	—
	Do. Northern Extn.	185	28.4.34	2,307	− 194	43	80,542	83,941	− 3,399	—	—	—	—	—
	Do. Western Extn.	211	28.4.34	1,122	+ 35	43	69,297	57,829	+ 11,468	—	—	—	—	—
	Cordoba Central	1,218	28.4.34	37,000	—	43	1,751,000	1,726,000	+ 25,000	Ord. Inc.	9¼	2½	5	Nil
	Costa Rica	188	Feb., 1934	16,729	− 1,400	35	145,713	157,900	− 12,187	Stk.	29	20	26½	79/16
	Dorada	70	Mar., 1934	9,500	+ 3,500	13	31,500	19,600	+ 11,900	1 Mt. Db.	76½	68¾	95	65/16
	Entre Rios	810	28.4.34	14,400	+ 1,200	43	664,600	643,600	+ 21,000	Ord. Stk.	26½	9	16½	Nil
	Great Western of Brazil ..	1,082	28.4.34	6,200	− 1,600	17	157,400	216,600	− 59,200	Ord. Sh.	23/6	1/2	5/4	Nil
	International of Cl. Amer.	794	Mar., 1934	$552,711	+ $61,146	13	$1,523,085	$1,356,820	+ $166,265	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/2	1/16	1/8	Nil
	La Guaira & Caracas ..	223¼	Apl., 1934	3,965	− 1,910	17	15,245	27,240	− 11,995	Stk.	16	10	10½	Nil
	Leopoldina	1,918	28.4.34	15,772	− 2,100	17	380,624	410,241	− 29,617	Ord. Stk.	20¼	10	10½	Nil
	Mexican	483	21.4.34	$248,800	+ $60,300	16	$3,625,100	$2,970,700	+ $654,400	,,	3	1/2	2½	Nil
	Midland of Uruguay ..	319	Mar., 1934	9.523	+ 409	39	87,516	77,061	+ 10,455	Ord. Stk.	2	1	1½	Nil
	Nitrate	411	15.4.34	12.324	+ 8,172	15	98,616	29,911	+ 68,705	Ord. Sh.	78/6	11/16	3/8	Nil
	Paraguay Central	274	28.4.34	5 040	+ 910	43	142,490	118.830	+ 23,660	Pr. Li. Stk.	72	49½	71	87/16
	Peruvian Corporation ..	1,059	Mar., 1934	66,977	+ 22,000	39	506,929	485,536	+ 21,393	Pref.	15¼	5	13	Nil
	Salvador	100	21 4.34	2,672	+ 400	43	63,122	122,514	− 59,392	Pr. Li. Db.	70	66½	70	71/8
	San Paulo	153½	22.4.34	28,042	− 6,001	16	467,075	490,077	− 23,002	Ord. Stk.	102	68	84	25/8
	Taltal	164	Mar., 1934	10 565	+ 4,795	39	56,780	33,985	+ 22,795	Ord. Sh.	13/4	3/4	1 3/4	5 11/16
	United of Havana.. ..	1,365	21.4.34	31,711	+ 11,866	42	813.831	819,584	− 5,753	Ord. Stk.	8	2	5	Nil
	Uruguay Northern ..	73	Mar., 1934	1,155	+ 92	39	10,546	13,693	− 3,147	Deb. Stk.	6	3½	5	Nil
Canada.	Canadian National ..	23,750	21.4.34	597,001	+ 92,046	16	9,342,969	7,627,619	+1,715,350	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	60½	38	68	5/8
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99¾	85	100½	4
	Canadian Pacific	17,018	21.4.34	438,200	+ 71,400	16	6,803,200	5,801,800	+1,001,400	Ord. Stk.	22⅛	11	17	Nil
India.†	Assam Bengal	1,329	31.3.34	29,557	+ 6,511	52	1,288,999	1,258,835	+ 30,164	Ord. Stk.	79	70	78½	313/16
	Barsi Light..	202	7.4.34	2,490	− 2,632	1	2,490	5,122	− 2,632	Ord. Sh.	101⅜	70	101½	515/16
	Bengal & North Western..	2,113	7.4.34	50,541	+ 1,530	1	50,541	49.011	+ 1,530	Ord. Stk.	292	240	278	5¾
	Bengal Dooars & Extension	161	7.4.34	2.184	+ 452	1	2,184	1,732	+ 452	,,	127	119	125	5/8
	Bengal-Nagpur	3,269	17.3.34	105.900	− 282	50	5,411,505	4,959,031	+ 452,474	,,	97¼	83½	101½	315/16
	Bombay, Baroda & Cl. India	3,089	21.4 34	165,450	+ 375	3	499.125	495,225	+ 3,900	,,	112	107	111½	5/8
	Madras & South'n Mahratta	3,230	31.3.34	117,975	+ 4,584	52	5,725,359	5,514,601	+ 210,758	,,	127	114¼	125½	7/16
	Rohilkund & Kumaon ..	572	7.4.34	12 879	− 378	1	12.879	13,757	− 878	,,	260	225	251	6
	South India	2,526	31.3.34	87,561	+ 7,292	52	4,032,081	4,136,307	− 104 226	,,	119½	112	117½	613/16
Various.	Beira-Umtali	204	Feb., 1934	47.001	+ 10,100	21	241,467	191,476	+ 49,991	—	—	—	—	—
	Bilbao River & Cantabrian	15	Mar., 1934	2,719	+ 1,180	13	5,962	3,532	+ 2,430	—	—	—	—	—
	Egyptian Delta	621	10.4.34	5,444	+ 12	1	5,444	5,432	+ 12	Prf. Sh.	13 1/32	1¾	2	Nil
	Great Southern of Spain ..	104	21.4.34	1,944	− 484	16	34,999	34,389	+ 610	Inc. Deb.	4	3	5½	Nil
	Kenya & Uganda	1,625	Aug., 1933	159,746	+ 12,456	35	1,523,550	1,273,216	+ 250,334	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33½	43½	8 11/16
	Mashonaland	913	Feb., 1934	82.002	+ 22,400	21	441,733	295,532	+ 146,201	1 Mg. Db.	91¾	42	94	5 5/16
	Midland of W. Australia ..	277	Feb., 1934	12 965	+ 445	34	108 714	104,268	+ 4,446	Inc. Deb.	89	70	96½	4⅛
	Nigerian	1,903	17.3.34	42.973	+ 6,828	51	1,777,936	1,810,435	− 32,499	—	—	—	—	—
	Rhodesia	1,538	Feb., 1934	140.537	+ 32,003	21	755,254	531,978	+ 223,276	4 p.c. Db.	98½	80¾	99 2/8	4
	South African	13,180	31.3.34	467,809	+ 72,472	53	23,731,975	20,631,147	+3.100.828	—	—	—	—	—
	Victorian	6,172	Jan., 1934	806 239	− 59,834	30	5,113,895	5,386,185	− 272 290	—	—	—	—	—
	Zafra & Huelva	112	Mar., 1934	11,420	+ 994	13	34,675	31,396	+ 3,279	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. ‡ Average rate of exchange for the week :—This year 3149/64. Last year 4025/64.